W E E K L Y R E P O R T S

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Belle Fourche

The feeder lambs were weighed on January 9 and the weights are given in the following table. Better gains were expected for this period than were realized.

Average Weights and Gains Made by Feeder Lambs in 30, 60, and 90-Day Periods

Lot No. and Rations	Average gain first 30 days	Average gain second 30 days	Average gain third 30 days	Av. gain after 90 days feeding	Av. wt. after 90 days feeding
	lbs.	lbs.	lbs.	lbs.	lbs.
Lot 1. Dry pulp	7.50	4.75	6.25	18.50	84.75
" 2. Dry pulp, cottonseed cake	8.33	7.97	8.17	24.27	91.84
" 3. Barley	5.18	10.50	8.00	23.68	89.50
" 4. Oats	5.50	7.50	8.00	21.00	86.50
" 5. Corn	10.48	8.50	11.25	30.23	96.50
" 6. Pressed pulp, cottonseed cake	8.03	4.75	6.50	19.28	85.00
" 7. Pressed pulp	4.75	4.50	9.00	18.25	84.50
" 8. Pressed pulp, molasses	6.75	6.00	4.00	16.75	83.00
" 9. Pressed pulp 60 days, barley and cottonseed cake to finish	3.62	7.00	9.50	20.12	87.75
" 10. Barley, cottonseed cake	5.85	8.00	10.25	24.10	89.25
" 11. Corn, cottonseed cake	9.02	10.92	10.75	30.69	96.50
" 12. Corn, linseed cake	9.90	10.00	9.50	29.40	94.00
" 13. Dry pulp, barley, cottonseed cake	5.05	10.25	8.50	23.80	91.50
" 14. Dry pulp, linseed cake	8.28	8.75	5.75	22.78	89.50
Average weight	--	--	--	--	89.26
Average gain per head	7.00	7.80	8.20	23.00	--
Average daily gain	.23	.26	.27	.26	--

Note: The death loss to date has been five: three in Lot 2 and two in Lot 11.

The Black Hills Dairy Show will be held at Vale on January 12 to 24. Eighteen cows have been entered. With butterfat at 20 cents a pound it will take No. 1 cows to pay the market price for their feed.

Beyer Aune.

Under date of January 28 Mr. Aune reported as follows:

"The weather is unusual for this time of the year. The temperature has been up to 50 and 60° during the day with hardly a light freeze at night. Some work is being done in the field; it was reported that some wheat has been planted.

Belle Fourche (cont'd)

"The Sugar Company has made the final payment on the beets, and will probably begin to write contracts next month.

"The lamb-feeding experiments will be finished on February 9, and the lambs will be on the Sioux City market February 16. The market today is $8.75 to $9.00 a hundred, and if it continues at this rate we may make some profit.

"The Dairy Show was a success. About 300 people were present the last day, and much interest was shown in the results. The good cows more than paid for their feed even with butterfat at 22 cents, the price it was bringing during the week of the show."

San Antonio

Report for the four weeks ending January 31

The weather of January has been characterized by cloudy days and excessive rainfall. There were 15 cloudy days and 10 partly cloudy days during the month. While a measurable quantity of precipitation was recorded for only eight days, the humidity was so high throughout the month that very little drying occurred and field work was almost continuously impossible. The total rainfall recorded, 5.67 inches, is 1.67 inches more than was ever before recorded at this station since the records were started in 1907. The entire amount came in the form of slow, soaking showers and no appreciable run-off occurred.

The mean temperature for January was only .6° below normal and no severely cold weather occurred. However, the continuously cloudy aspect of the sky together with relatively low mean temperatures the first part of the month kept the soil so cool that the growth of winter crops was decidedly slow. Temperatures of 32° or lower were recorded for eight nights, while a maximum of 70° or more was recorded for only three days. Notwithstanding their slow growth, the condition of all flax and small grain plantings is now excellent.

The following is a summary of the meteorological data recorded during the four weeks and for the month of January:

Week ending	Temperature						Precipitation	Aspect of the sky		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean						
							Inches	Days	Days	Days
Jan. 10	71	63.7	28	37.7	50.7	37	1.88	3	2	2
" 17	61	53.3	30	37.0	45.1	31	1.47	1	3	3
" 24	70	62.0	30	38.3	50.1	33	--	2	2	3
" 31	70	63.6	48	53.4	58.5	22	2.32	0	1	6
Month of Jan.	71	60.6	28	40.7	50.7	37	5.67	6	10	15

Some delayed fall plowing in fields A-3 and C-5 was completed the first part of the month, and the second date-of-planting flax plots were seeded. During the greater part of the month station labor was kept busy at miscellaneous repair and clean-up jobs.

Station visitors included Messrs. Dawson and Jordan of the Bureau of Chemistry and Soils, January 7, and Messrs. Neal and Eaton, of the Office of Cotton, Rubber, and Other Tropical Plants, January 21 and 22.

San Antonio (cont'd)

The Superintendent attended the annual State and Federal Cotton Rootrot conference at College Station, Texas, January 19 and 20.

Geo. T. Ratliffe.

Scotts Bluff

The average maximum temperature for the week ending January 10 was 42° with a maximum of 50 on the 5th, the average minimum was 12 with a minimum of 7 on the night of the 9th. The average hourly wind movement for the week was 6 miles. No precipitation was recorded.

For the first time since the Weather Bureau station was established here has this much of the winter passed without zero weather being recorded. So far the lowest temperature has been 3° above zero.

It has been fortunate for winter grain that the extremely dry winter has brought no low temperatures. Winter grain on the dry land is looking very well; and if there is some moisture before the cold weather which will probably come during the next six weeks, the grain will no doubt come through in good shape.

Results of a test in the dairy herd at the Scotts Bluff Field Station in which are compared rations of roughage only (corn silage, alfalfa hay, and pasture) and the same roughage supplemented with grain concentrates. April 1930 to December 1930, inclusive. (This test will continue two years)

Items		Lot 1* Roughage with grain	Lot 2* Roughage
Total milk production	lbs.	61,025	44,482
Total butterfat production	"	3,036.4	1,505.4
Per cent of butterfat in milk	%	.0533	0.0539
Total value of product	$	387.69	657.39
Cost of roughage including pasture	$	193.28	217.78
Cost of grain	$	212.37	0.0
Total cost of feed	$	405.65	217.78
Value of product above cost of feed	$	482.04	439.61
Income from each dollar invested in feed	$	2.19	3.02
Cost of producing 100 pounds of milk in terms of feed	$	.665	.490
Cost of producing 1 pound of butterfat in terms of feed	$	.199	.145

*Six cows in lot.

The following grain mixture is used in this test and was worked out by Prof. H. P. Davis, Chairman, Dairy Husbandry Department, College of Agriculture, Lincoln, Nebraska:

		Pounds digestible protein	Pounds total nutrients
200 pounds	ground barley	18.0	158.8
100 "	standard wheat bran	12.5	80.9
100 "	molasses dry pulp	4.6	71.6
100 "	choice cottonseed meal	37.0	78.2
500		72.1	389.5
	Percentage	14.42	77.9

Scotts Bluff (cont'd)

The Station will not carry on the dry-lot feeding of calves this winter as it has been impossible to get the quality of calves in the number needed for the test.

All the sugar factories in the valley are now closed for the 1930 season. The year was a prosperous one for the sugar beet grower, as this is the only crop this year that has been worth much more than the cost of production. The yield over the entire district was good, the estimate of 14.5 tons per acre being the actual yield except for the Mitchell district, where the average was 15.5 tons.

The average maximum temperature for the week ending January 17 was 37°, with a maximum of 51 on the 15th; the average minimum was 8, with a minimum of 2 on the night of the 13th. There was no precipitation during the week. The average hourly wind movement was 8.8 miles.

General conditions in the valley remain poor. There has been no strengthening of the potato market, and the prices of all other crops have declined. Alfalfa hay is selling for from $3.00 to $5.00 a ton in the stack. Wheat, corn, barley, and oats have also gone to lower price levels. Eggs still remain at 15 cents to 20 cents per dozen to the grower, and there is little promise of much better prices this spring. Butterfat is now selling at 21 cents per pound at the creamery and 20 cents at shipping points. Country butter is bringing 25 cents and creamery butter 31 to 35 cents per pound.

A few more lambs are being brought into the valley for feeding, ten cars coming in last week for one feeder. A number of other feeders are out looking for lambs. The general impression is that the late market will be the best this year.

The Beet Growers' Association met during the week and reelected the same officers and directors. They are beginning their work earlier than usual and are making a great effort to line up all of the growers for the coming season. They have gone on record as opposed to any reduction of price for the current season and they are also asking for a better sliding scale proposition.

The average maximum temperature for the two-week period ending January 31 was 52° with a maximum of 66 on the 29th. The average for the month, 46°, has been equalled only once, which was in 1919. The average maximum for January since 1912, when records were first kept at the station, has been 36°. The average minimum for the period has been 16° and for the month 14°. The average for January 1930 was 7 below zero, which was the coldest month recorded at this station since it was established.

The movement of stock to market has commenced. The stock train leaving the valley the last of this period took out 44 cars of lambs and 14 cars of cattle. The price of lambs has remained at a fairly steady figure, but this cannot be said of other stock.

The price of potatoes shows no increase and the demand seems to be very light. Butterfat has added 2 cents during the period, but the price of eggs has declined to a new low figure of 12 cents per dozen, the lowest ever known in this valley at this season of the year. Seldom has the price ever been so low at any time.

The Cooperative Poultry Association has just sold the last of the 1930 turkeys, the shipment amounting to four carloads. The price obtained was 37½ cents a pound for No. 1's. This was about 10 cents

Scotts Bluff (cont'd)

more than the Thanksgiving and Christmas prices. The growers will receive about $30,000.

The valley responded to the appeal for help from the drouth-stricken areas, and during the period contributed and forwarded to the Red Cross in Arkansas 17 carloads of foodstuffs, consisting of potatoes, beans, wheat, barley, vegetables, meats, and other farm products, in addition to several hundred dollars in cash.

The Superintendent left at the end of the month for the Washington office, and Mr. Harris is in Lincoln to confer with the officials there relative to the horticultural work to be carried on this year.

The extremely mild winter has caused the swelling of fruit buds and some of the shrubs in protected places are almost in leaf. The early flowers are coming out and violets are in bloom in some of the lawns. Grass is beginning to turn green where there is any moisture, but in most places the ground is extremely dry.

James A. Holden

M I S C E L L A N E O U S

A manuscript entitled "Potatoes in Irrigated Rotations at the Huntley Branch Station" by D. A. Savage, formerly Junior Agronomist at the Huntley Field Station, has been approved for publication by the Montana State Experiment Station.

Mr. C. S. Scofield, Principal Agriculturist, left Washington on January 9 for California, where he will be engaged for the next few months in work in connection with the boron investigations.

Mr. Dan Hansen, Superintendent of the Huntley Field Station, and Mr. James A. Holden, Superintendent of the Scotts Bluff Field Station, are in the Washington office preparing reports and conferring with officials of the Department regarding the work of their respective stations.

W E E K L Y R E P O R T S

Of The Office Of

WESTERN IRRIGATION AGRICULTURE
(Not for Publication)

Vol. XXXIII February 7, 14, and 21, 1931 No. 2

Huntley

Report for the week ending February 21

The weather continues to be extremely dry and mild. The total precipitation from November 1 to February 15 amounted to but .71 inch. High winds on a few days during the past month have resulted in soil blowing, and it is probable that this condition will have a bad effect on winter wheat.

During the past month field work has been possible most of the time. Fall plowed lands have been worked down and on the lighter soils plowing has been in progress.

The season has been particularly favorable for lamb feeding, and most feeders have realized some profit from their operations. Feeders were bought in November at $5.00 per hundredweight, and the St. Paul market for fat lambs is now around $8.50.

Alfalfa hay has declined in price since last fall and can be bought now at $7 to $8 per ton, farm price. Great Northern beans are quoted at $2.60 per hundredweight, a drop from $4.50 to $5.00, the price at last harvest time. Fairly heavy stocks of beans are held yet on farms. Butterfat is selling at 24 cents.

The lamb-feeding experiment at the station was completed February 9. This experiment was conducted in cooperation with the Montana Experiment Station. Nine lots of lambs were fed on various rations including barley, corn, hard and soft wheat, cottonseed cake, and sugar beet by-products. The lambs were on feed for a period of 70 days. The results of this experiment are reported elsewhere in this issue.

A "Lamb Feeders' Day" was held on February 16, at which time the results of the test were presented by Mr. F. B. Linfield, Director, and Prof. Louis Vinke of the Animal Husbandry Department of the Montana Station. About 200 people attended this meeting.

Dan Hansen.

Scotts Bluff

The following table summarizes the production of the dairy herd at this station during the last year. It shows a reduction in the unit cost of production over last year of 16 per cent per 100 pounds of milk and of 14 per cent per pound of butterfat. The price received was about 18 per cent less than for the previous year.

SUMMARY OF PRODUCTION OF DAIRY HERD ON THE SCOTTS BLUFF FIELD STATION IN 1930

Number* of cow	Number of months in milk	Production			Value of production	Cost of feed			Value of product above feed cost	Unit cost of feed	
		Milk	Butterfat								
			Per cent	Pounds		Roughage	Grains	Total		Per 100 pounds of milk	Per pound of butterfat
		Lbs.									
103	12	11,976	3.9	462.4	$196.58	$53.85	$41.41	$95.26	$101.32	$0.796	$0.202
108	9	12,663	3.4	434.9	184.49	55.16	3.52	58.68	125.81	.465	.135
109	11	17,037	3.4	583.2	254.82	53.08	58.45	111.53	143.29	.673	.197
111	11	11,744	3.2	374.3	169.59	48.83	43.75	92.58	77.01	.828	.247
112	10	7,040	3.9	273.6	113.31	53.99	4.86	58.85	54.46	.838	.215
117	8	9,508	3.5	331.4	141.18	54.47	18.11	72.58	68.60	.764	.218
118	10	9,941	3.3	322.3	145.59	55.52	6.25	61.77	83.82	.622	.191
121	10	11,436	3.0	370.6	164.38	52.20	41.42	93.62	70.76	.753	.255
122	11	11,188	3.8	421.3	182.78	53.85	40.24	94.09	88.69	.841	.223
130	10	9,385	3.7	351.6	153.83	55.48	15.32	70.80	83.03	.755	.202
8	9	13,644	3.4	465.2	198.29	51.05	50.47	101.52	96.77	.745	.218
9	10	10,455	3.2	332.5	154.03	55.52	12.53	68.05	85.98	.650	.205
12	10	12,317	3.3	411.1	181.75	53.45	46.70	100.15	81.60	.813	.244
Total	--	148,334	--	5,134.4	2,240.62	696.45	383.03	1,079.48	1,161.14	---	---
Avg.	10	11,400	3.5	395.0	172.35	53.59	29.45	83.04	89.32	.734	.211

*The numbers below 100 indicate grade and the numbers above 100 indicate purebred Holsteins.

Note: The average price of butterfat during the year was 33.67 cents per pound, and skim-milk was valued at 40 cents per 100 pounds.

One of these cows, No. 103, a purebred, has a "long distance" record that is seldom equalled. She freshened in November 1928 and has been in milk ever since, as it has been impossible to get her with calf. During this time and to December 31, 1930, she has produced 34,390 pounds of milk and 1,330.5 pounds of butterfat, which amount to an income of $397.77 above her feed cost. The month of her heaviest production was December 1928, with 2,161 pounds of milk and 90.1 pounds of butterfat; and her lightest month was December 1930, with 854 pounds of milk and 34.2 pounds of butterfat. Her average for the entire period was 1,348 pounds of milk and 52.2 pounds of butterfat per month. In the herd for the past year she was second highest in fat production and sixth in milk production. This production was obtained with no extra care or feeding and by milking twice a day.

Scotts Bluff (cont'd)

The average maximum temperature for the week ending February 7 was 54°, with a maximum of 60 on the 4th; the average minimum was 21, with a minimum of 16 on the night of the 6th. The average hourly wind movement for the period was 6.8 miles. There has been no precipitation so far this year and only 0.08 inch for the winter months. The total snowfall for the winter has been about 6 inches.

The shipment of sheep from the valley is gradually increasing. About 60 cars will go out this week-end and the first of next week. Beginning with Monday, February 9, the Burlington will put on a stock train in addition to the regular Friday train, which will continue throughout the shipping season. About 25 cars have been ordered for that train.

Unofficial reports from the North Platte River watershed are to the effect that the snowfall in the mountains has been very light. Whether or not there will be a water shortage this coming season will, therefore, depend on the late snows that may come during the next two months. The Pathfinder Reservoir is now about half full, containing a little over 500,000 acre-feet.

The winter wheat in the dry land section is still in fairly good condition and may come through the winter in good shape if there are no low temperatures before some moisture comes.

With the exception of butterfat, the prices of farm produce have made another decline during the week. Eggs dropped to 11 cents a dozen, and there is no demand for potatoes at 85 cents a hundred pounds. Butterfat has increased 2 cents and is now bringing 25 cents a pound at the creamery.

The lambs and steers that are on feed are making good gains. Some of the lamb feeders who have shipped have made good profits, having bought lambs at 5 cents and sold them for more than 8 cents a pound.

The average maximum temperature for the week ending February 14 was 48°, with a maximum of 58 on the 14th; the average minimum was 15, with a minimum of 9 on the night of the 8th. The average hourly wind movement for the week was 6.0 miles. There was no precipitation during the period.

The operations at the station have consisted of the routine work of caring for the stock and cleaning up from the pruning of fruit trees and berries and grape-vines. A considerable expansion of the horticultural work is planned for the station. Variety tests have been planned for both fruit and vegetables, and the hot house is being prepared for the work which will commence about March 1 in the planting of seeds that will require transplanting for these variety tests of vegetables.

The movement of lambs to market continues at about half the rate of shipment last year. From January 1 to the end of last week this section had moved 246 cars as compared with 364 cars last year and 345 two years ago. Considering the fact that only about 60 per cent as many are being fed this year as last, the movement is considerably ahead of last year. The price has held fairly steady.

The new County Agent, J. P. Ross, formerly County Agent of Hamilton County, has taken up his work in this county. He is said to be exceptionally strong in club and county fair work, so that he

Scotts Bluff (cont'd)

should be able to carry on the work started by D. H. Propps in a very satisfactory manner.

The Great Western Sugar Company has announced that owing to the chaotic condition of the sugar market they are unable as yet to determine what the price of sugar beets will be for this season. The growers are continuing their organization work and have announced that they will not accept less than $7.00 a ton.

The prices for eggs and butterfat still decline. The price of eggs has been as low as 8 cents per dozen and the creameries are paying 20 cents for sour cream. The cheese factory is paying 31 cents per pound butterfat for the whole milk.

The average maximum temperature for the week ending February 21 was 51°, with a maximum of 63 on the 19th; the average minimum was 23, with a minimum of 18 on the night of the 16th. The first precipitation of the year came on the 21st. Between 2 and 3 inches of snow fell accompanied with some wind, so that the measure of precipitation, 0.02 inch, is not accurate. The snow drifted some. The average hourly wind movement was 8.4 miles.

During the past week some fencing has been done in Field C on the sweet clover pastures. In the poultry plant the incubators have been gone over and made ready for the work of the coming season.

Under the direction of Mr. Lionel Harris, there will be a considerable expansion in the work of the station on fruits and vegetables. Variety tests of the standard vegetables will be carried on, and efforts will be made to have a better balanced farm garden. Considerable attention will be given to the small fruit industry and a search for better varieties will be instituted. Varieties of apples and plums that have not proved practical here will be replaced by others that are better adapted to the conditions in this section.

The movement of stock to market is increasing. During the first three weeks of February 221 cars of lambs have gone out. The total shipment from January 1 has been about 425 cars. This is about 70 per cent of the number that were shipped out last year at this time, and considering the difference in the number being fed, the rate of shipment corresponds fairly well with last year. About 25 cars of cattle were shipped out during the week.

C. H. Gustafson, representing the Farm Board, has been in the valley this week in the interest of cooperative marketing, especially with a view to assisting the cheese factory officials in their problems, the most important of which seems to be the one of marketing.

The Great Western Sugar Company has been holding a series of meetings during the past week, which will continue into the coming week, to discuss fertilizing problems. Nothing yet has been said regarding the price of beets for the coming season. There seems to be an unusual apathy regarding it on the part of the growers. There is nothing like the usual amount of excitement over the contract that is usually manifested at this time of the year. The general impression is that there will be a reduction in price; and the bankers have stated that if the price is fixed at $6.00 a ton, they will be able to finance only about 30 per cent of the growers. Some of the farmers are planning to grow other crops if there is a reduction in the contract price of sugar beets.

James A. Holden.

Yuma

For the four-week period ending January 31 the maximum temperature was 84, mean maximum 71.1, minimum 26, mean minimum 37.8. The mean temperature of 54 4 was about one degree above normal and about three degrees warmer than January 1930. The precipitation was .02 inch. With the exception of one light shower the weather has been cool and dry for the entire month.

Cotton ginning on the project continues with eleven of the fourteen gins still in operation. The number of bales turned out to January 31 was 30,100. Most of this late cotton is "bollies", for which the growers are getting about 8 cents a pound for the lint. It costs 50 cents a hundred for this cotton to be picked or snapped.

Station work performed during the month included ginning of cotton, repairing irrigation ditches and structures, plowing cotton lands, planting alfalfa and sweet clover, pruning trees and ornamental shrubs, manuring rotation plots, and general irrigating and cultivating.

Mr. Frank A. Thackery visited the station on January 2. Mr. and Mrs. Scofield were station visitors on January 13 and 14, and Mr. A. C. Cooley on January 24.

E. G. Noble.

M I S C E L L A N E O U S

FATTENING LAMBS AT THE HUNTLEY FIELD STATION

Fattening tests with lambs were started in the fall of 1929 in an effort to obtain reliable experimental data on different Montana feeds, combinations of feeds, and methods of feeding. The results here presented represent the work of the winter of 1930-1931 with references to the work of the preceding winter.

Lambs used. Range lambs with a predominance of fine wool breeding were used in this test. Mostly wethers, they were smooth and of good type and quality.

Description of Feeds

Barley: Trebi, clean, plump; 50 pounds per bushel.
Hard wheat: No. 2 Dark Hard Winter; 57 pounds per bushel.
Soft Wheat: No. 1 Federation; 60 pounds per bushel.
Corn: No. 2 yellow, of good quality; 56 pounds per bushel.
Oats: No. 1 oats; 42 pounds per bushel.
Cottonseed cake: Prime quality sheep size; 43 per cent protein.
Molasses: Beet, from the Great Western Sugar Co.
Beet tops: Exceptionally good and dry, but crowns of beets not palatable.
Beet pulp: Ensiled pulp from pulp silo at station. Secured from Great Western Sugar Co. During last week or two of trial fresh pulp was received from Billings.
Alfalfa: Good quality first cutting hay.

FATTENING LAMBS
Dec. 1, 1930 to Feb. 9, 1931
70 Days

Lot number	I	II	III	IV	V	VI	VII	VIII	IX
Ration	Barley alfalfa	Barley, beet tops alfalfa	Barley, beet pulp alfalfa	Hard wheat, beet pulp alfalfa	Soft wheat, beet pulp alfalfa	Corn, beet pulp alfalfa	Barley, beet pulp, c.s. cake alfalfa	Barley, pulp, c.s. cake molasses alfalfa	Oats, beet pulp, alfalfa
Number of lambs	27	27	27	27	27	27	27	27	27
Average initial weight lbs.	75.5	74.9	75.3	74.9	74.5	76.3	76.2	76.6	75.9
Average final weight "	100.3	102.1	104.7	105.1	104.0	105.5	108.2	110.3	109.4
Average daily gain "	.353	.388	.420	.431	.420	.417	.458	.481	.478
Average daily feed: lbs.									
Barley	1.12	1.09	.98	---	---	---	1.00	1.00	---
Hard wheat	--	--	--	1.02	---	---	--	--	---
Soft wheat	--	--	--	--	.97	---	--	--	---
Corn	--	--	--	--	--	.92	--	--	---
Oats	--	--	--	--	--	--	--	--	1.04
C.s. cake	--	--	--	--	--	--	.20	.20	--
Beet molasses	--	--	--	--	--	--	--	.26	--
Siloed beet pulp	--	--	6.64	6.64	6.64	6.64	6.65	6.65	6.65
Beet tops	--	2.35	--	--	--	--	--	--	--
Alfalfa	2.38	1.59	1.61	1.65	1.66	1.69	1.65	1.61	1.71
Cost per cwt. gain*	$6.53	$5.77	$5.83	$5.84	$5.87	$5.93	$6.29	$6.48	$5.34
Initial cost per cwt.	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00
Initial cost per lamb	4.53	4.49	4.52	4.49	4.47	4.58	4.57	4.60	4.55
Feed cost per lamb	1.62	1.56	1.71	1.76	1.73	1.73	2.02	2.18	1.79
Selling price So. St. Paul**	8.10	7.80	8.60	8.70	8.75	8.65	8.70	8.70	8.70
Selling price Huntley (So. St. Paul less $1.50)	6.60	6.30	7.10	7.20	7.25	7.15	7.20	7.20	7.20
Value per head Huntley	6.62	6.43	7.43	7.57	7.54	7.54	7.79	7.94	7.88
Margin over lamb & feed cost	.47	.38	1.20	1.32	1.34	1.23	1.20	1.16	1.54

*Feed prices (per ton): Grain $20.00, cottonseed cake $40.00, beet molasses $20.00, pulp (siloed) $2.00, beet tops $3.00, alfalfa $10.00.

**Prices based on a top price of $9.00 per cwt. at So. St. Paul. Weight not taken into consideration in determination of price per cwt. All grains were fed whole.

Fattening Lambs (cont'd)

Sickness and Loss. The lambs were originally started on the test in October, but in the second week of November an outbreak of scours occurred, which was believed to be due to the third cutting hay fed at that time. All of the lambs were changed to first cutting alfalfa and oats, and the original trial was abandoned. After recovering, the lambs that appeared normal in every respect were relotted into nine lots of 27 head each. Only two of the lambs died during the tests. Losses could not be attributed to any particular ration.

Method of Feeding

Time of feeding. A light feed of hay was given the first thing in the morning, a larger amount was fed the middle of the forenoon, which was stirred up at noon, and a heavy feed was given at dusk. All the other feeds were fed twice daily, morning and evening.

Place of feeding. Molasses and cake were fed on the pulp along the panels. All roughages were fed along the feeding panels. Grain was fed in the grain feeding pens, and the time allowed in which to consume it was 30 minutes.

Feed allowance. The cottonseed cake was limited to one-fourth pound per head daily. The molasses was limited to one-third pound per head daily. All grain rations and roughages were full-fed.

Comparison of Results

Lots I, II, and III. The addition of beet tops to a barley and alfalfa ration in Lot II resulted in increased gains, a lower daily grain consumption, a lower cost of gains, a lower percentage of finished lambs, a lower selling price, and less margin over lamb and feed costs than in Lot I, which was fed barley and alfalfa. This tallies with results obtained at this station in a previous trial.

The addition of siloed beet pulp to a barley and alfalfa ration in Lot III gave greater gains with less grain consumption, a lower cost of gains, a higher selling price, and a greater margin over lamb and feed costs than in Lot I, which was fed barley and alfalfa. This corresponds with results obtained at this station last year and also checks with a similar trial conducted at Chinook. In comparison with Lot I, if the difference in net returns is credited to the pulp, siloed beet pulp is worth $5.15 per ton.

In this trial as well as in a previous trial the addition of pulp to a barley and alfalfa ration gave more satisfactory results than the addition of beet tops.

Lots III, IV, V, and VI. Lot IV, which was fed a ration of hard wheat, pulp, and alfalfa, made slightly more rapid gains, consumed slightly more grain, the cost of gains was about the same, the lambs were valued at a slightly higher figure, and made a little more margin over lamb and feed costs than Lot III, which was fed barley, pulp, and alfalfa. A significant difference in favor of wheat over barley when fed with beet by-products resulted in a trial at Chinook last year.

Lot V was fed soft wheat, pulp, and alfalfa and is therefore comparable to Lot IV, which was fed hard wheat, pulp, and alfalfa. Lot V made slightly lower gains, consumed less grain at approximately

Fattening Lambs (cont'd)

the same cost per hundredweight gain, had about the same selling price, carrying only a trifle more finish, and the net returns were about the same for both lots. The results of this comparison indicate that hard and soft wheats have about the same feeding value when fed with pulp and alfalfa.

Lot VI was fed corn, pulp, and alfalfa and is therefore comparable to Lot III, which was fed barley, and Lots IV and V, which were fed hard and soft wheat. Lot VI made about the same rate of gain as the barley-fed lot and the soft wheat-fed lot and a little lower gain than the hard wheat-fed lot. In cost per hundredweight gain the corn-fed lot was slightly higher than Lots III and V, and in selling price it ranked between barley and wheat. In net returns the corn-fed lot was lower than Lots III, IV, or V.

Lots III and VII. The addition of cottonseed cake to a ration of barley, pulp, and alfalfa in Lot VII resulted in greater gains, about the same grain consumption, a greater cost of gains, a slightly greater selling price, and the same net returns over lamb and feed costs as Lot III, which was fed barley, pulp, and alfalfa. In two previous trials, one at this station and one at Chinook, the results were similar to those obtained from this test. Gains were increased, but the cost of gains was increased enough to offset the increased selling price and net returns.

Lots VII and VIII. The addition of beet molasses to a ration of barley, pulp, cottonseed cake, and alfalfa in Lot VIII gave a greater daily gain, about the same grain and roughage consumption, a greater cost of gains, the same selling price and finish, and a slightly less return over lamb and feed cost than Lot VII, which was fed barley, pulp, cottonseed cake, and alfalfa. This tallies with previous trials at this station and Chinook.

Lot IX. Lot IX was fed a ration of oats, pulp, and alfalfa. It is therefore comparable to Lots III, IV, V, and VI, which were fed other grains with pulp and alfalfa. Lot IX made more rapid gains at a lower cost and made greater net returns without an increase in selling price. The results obtained in this lot were unexpected because oats rank very low as a fattening feed in other rations. This ration can not be recommended unless further trials prove its supremacy in such rations.

Conclusions

1. A ration of barley and alfalfa seems inadequate for finishing lambs in Montana. In three trials lambs fed a ration of barley and alfalfa showed the least finish of any of the grain-fed lots.

2. In two trials the addition of beet tops to a barley and alfalfa ration during the entire feeding period resulted in greater gains, but less finish and less profits than where barley and alfalfa made up the ration.

3. In three trials the addition of pulp to barley and alfalfa materially improved the ration. If the differences in profit of these trials are credited to pulp, pulp shows a feeding value of $4.15 per ton.

Fattening Lambs (cont'd)

4. Soft and hard wheat each proved to be better feeds than barley when fed with pulp and alfalfa. The net returns per lamb were 10 per cent less when fed barley than when fed wheat.

5. There was no material difference in the feeding value between hard and soft wheat when fed with pulp and alfalfa, according to this trial.

6. A ration of corn, pulp, and alfalfa resulted in less rapid gains, higher cost of gains, and less profit than did a ration of wheat, pulp, and alfalfa. In this trial corn proved to be only slightly superior to barley.

7. The results of three different trials indicated that the addition of cottonseed cake to barley, pulp, and alfalfa increased the gains, the cost of gains, and the selling price, but not the financial returns.

8. According to two trials, the addition of molasses to a ration of barley, cottonseed cake, pulp, and alfalfa increased the gains, increased the cost of gains, and reduced the profits.

9. In this trial oats gave more rapid and economical gains and gave greater net returns than barley, corn, hard wheat, and soft wheat when fed with pulp and alfalfa. However, further trials are necessary before oats can be recommended in such a ration.

(These trials must be repeated before final conclusions can be drawn)

Fattening Lambs (cont'd)

Contract Feeding

Many lambs in Montana are fed on a spread or under contract. The following table shows the results of this year's feeding test if the lambs were purchased at $5.00 per hundredweight and sold at $7.00 per hundredweight. Labor, 8 per cent interest on the lambs and half the feed, 4 per cent death loss, and depreciation of equipment were charged at $1.15 per lamb.

FATTENING LAMBS ON A SPREAD
In at $5.00; out at $7.00
70- Day Feed
Dec. 1, 1930 to Feb. 9, 1931
On Basis of One Lamb

Pot number	I	II	III	IV	V	VI	VII	VIII	IX
Ration	Barley, alfalfa	Barley, tops alfalfa	Barley, pulp alfalfa	Hard wheat, pulp alfalfa	Soft wheat, pulp alfalfa	Corn, pulp alfalfa	Barley, pulp, c.s.cake alfalfa	Barley, pulp, c.s.cake molasses alfalfa	Oats, pulp alfalfa
Average gain per lamb ....lbs.	24.8	27.2	29.4	30.2	29.5	29.2	32.0	33.7	33.5
Initial weight less 4% @$5.00 per cwt.	$3.62	$3.59	$3.61	$3.59	$3.57	$3.66	$3.66	$3.67	$3.64
Feed cost	1.62	1.56	1.71	1.76	1.73	1.73	2.02	2.18	1.79
Labor, interest on lambs, and feed and death loss	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Total cost	6.39	6.30	6.47	6.50	6.45	6.54	6.83	7.00	6.58
Final weight less 4% @ $7.00 per cwt.	6.74	6.86	7.03	7.06	6.99	7.09	7.27	7.41	7.35
Net gain per lamb	.35	.56	.56	.56	.54	.55	.44	.41	.77

W E E K L Y R E P O R T S

Of The Office Of

WESTERN IRRIGATION AGRICULTURE

(Not for Publication)

Vol. XXXIII February 28 and March 7, 1931 No. 3

Huntley

Weather conditions continued dry and unseasonably warm during the week ending February 28 and favored outside work during most of this time. The maximum temperature recorded was 58, minimum 18, and precipitation .38 inch.

Work was begun on the installation of the pump irrigation system for field P. This will provide water for 55 acres in this and an adjoining field.

Work was also started on the construction of an additional room to the bunkhouse and interior painting and repairing of other station buildings.

The lambs that were used in the feeding tests during the winter were turned back to the contractor on February 28. These lambs made an average gain of 41 pounds. They were fed on a "spread" basis, being taken in at $5.00 per hundredweight and turned back to the contractor at $7.25.

The price to be paid for sugar beets this year has not yet been given out. It is understood that representatives of the Growers' Association and the Sugar Company are considering this question now, and it is probable that the terms of the new contract will be announced within a short time.

Dan Hansen

Prosser

Report for period ending March 7

The winter of 1930-31 was very mild in the Yakima Valley, and an early spring seems likely. This fact connects up directly with the almost inevitable water shortage for the coming season. The storage records to date show that the reservoirs contain only two-thirds the normal amount of water for this time of the year. The amount of snow in the mountains is also below average, and only an unusual amount of late precipitation in the mountains can relieve the situation. This already serious condition is aggravated by the development of between thirty and forty thousand acres on the Kittitas Project.

Steps are being taken to conserve water as much as possible. The run-off water has been in the upper canals of the project for the past month and is expected at the station about March 10. These cultural practices have been recommended by the U. S. Bureau of Reclamation: 1. Make all pipe lines, flumes, and ditches as efficient conductors of water as possible. 2. Clean cultivate orchards. 3. Plant crops that mature early.

Farming operations in the Yakima Valley have been continued largely without interruption throughout the greater part of the winter owing to the mild weather and for the past month have been in full

Prosser (cont'd)

swing in the Valley. At the Station most of the manure has been hauled out on the plots, and a number of acres have been plowed. One large field has been seeded to sweet clover. Wheat will be seeded soon on several of the plots.

The irrigation investigations carried on for several years by Mr. C. C. Wright on four different crops—namely, alfalfa, wheat, corn, and potatoes—will be continued this year. The irrigation project which was started last year on the Station apple orchard will also be continued. If possible, a new metal flume will be installed to replace the earthen ditch on the north side of the apple orchard. This will make water measurements for the orchard more accurate.

Carl A. Larson

San Antonio

Report for the four weeks ending February 28

The month of February was unusual in both rainfall and temperatures. Measurable amounts of precipitation were recorded for eleven different days, with a total of 2.32 inches for the month, .72 inch above normal. Practically all of this rain fell so slowly that no run-off occurred. Very little drying weather prevailed and team work in the fields was possible during parts of only two days. The minimum temperature of 36 is 4° higher than any February minimum previously recorded at the station. Maximum temperatures ran unusually low, however, with the result that the mean for the month is only one degree above normal. No sudden and extreme changes in temperature such as are common during this month were experienced. The following table gives a summary of February climatological data.

Week ending	Temperature						Precipitation	Aspect of the Sky		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean						
							Inches	Days	Days	Days
Feb. 7	72	68.7	42	49.3	59.0	25	.77	2	3	2
" 14	77	65.3	36	42.7	54.0	33	.16	3	1	3
" 21	76	67.7	38	45.6	56.6	32	1.12	3	2	2
" 28	76	65.0	39	43.7	54.4	29	.27	1	1	5
Month of Feb.	77	66.7	36	45.3	56.0	33	2.32	9	7	12

Farm labor was mostly employed on miscellaneous odd jobs. Two plots in the time-of-planting flax test were seeded and one rotation plot was plowed. Repair of the station mess hall and other buildings, made possible by the special appropriation for the relief of unemployment, was started February 17.

Mr. Paul R. Dawson, Associate Biochemist, and Dr. E. R. Collins, Assistant Soil Technologist, of the Bureau of Chemistry and Soils, were station visitors February 28.

Geo. T. Ratliffe

Scotts Bluff

The average maximum temperature for the week ending February 28 was 43°, with a maximum of 55 on the 26th; the average minimum was 23, with a minimum of 11 the night of the 28th. The average hourly wind movement was 7.5 miles. There was another snowfall of about an inch with a measured precipitation of .04 inch, making a total of .06 inch for the year.

No zero weather has been recorded this winter. The months of December, January, and February have shown a maximum temperature considerably above the normal, but the minimum has not varied so much from the average, as the following table shows:

	December		January		February	
Year	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
1911	46	15	42	15	42	12
1912	38	9	32	8	36	13
1913	41	13	39	7	27	2
1914	29	7	42	21	37	8
1915	31	12	38	6	43	16
1916	47	14	32	2	46	15
1917	33	6	36	7	43	13
1918	48	12	28	5	36	16
1919	38	15	46	16	33	10
1920	33	10	41	16	39	14
1921	38	14	40	14	42	18
1922	35	15	31	6	38	10
1923	36	15	45	18	39	8
1924	41	12	31	4	45	21
1925	31	8	39	12	49	22
1926	38	14	34	10	50	25
1927	36	14	38	10	43	17
1928	36	6	42	14	43	12
1929	34	9	30	9	27	7
1930	46	17	21	- 7	50	22
20-year average	38	12	36	10	40	14
1931	41	13	46	14	50	24

The temperatures this winter have been much more uniform than during the past, and there seems to be less risk from advanced fruit tree growth than in years when the average temperatures are lower.

One hundred and twelve cars of lambs were shipped out of the Valley at the end of the week. This is considerably less than the shipments at this time last year but probably fairly in line with the decreased number on feed this year. There is probably a tendency also to hold back all that can be without getting too weighty, in the hope that the late spring market will be better. The price has kept up fairly well.

Eggs are now bringing 12 cents per dozen and butterfat 23 cents per pound. The prices of other farm products have remained about the same. Nothing has been announced regarding beet contracts for the coming year.

The Farm Bureau met last week and elected a new board, which, in turn, will elect officers at a future meeting.

Scotts Bluff (cont'd)

The meetings held in the valley last week by representatives of the Farm Bureau Federation were well attended in all localities, and many new members were signed up. The Cooperative Beet Growers' Association states that during these meetings it has secured many new members and that it is in a good condition to discuss the terms of contract with the Sugar Company.

The soil conferences held by officials of the Great Western Sugar Company have also created a great deal of interest among the farmers. It is probable that much more fertilizer will be used this year than ever, if satisfactory prices are offered for beets.

The average maximum temperature for the week ending March 7 was 41°, with a maximum of 61 on the 4th; the average minimum was 16, with a minimum of zero on the night of the 5th. The weather station at Scottsbluff reported only 5° above that morning. It is possible that this thermometer may not be registering correctly, as it would seem logical for this station to register higher than the one down on the river. There was about an inch of snowfall during the period with a moisture content of .08 inch, making a total of .14 inch for the year. The week has been a windy one, the total average velocity being 12.2 miles per hour.

The stock shipments from the valley continue at about the same rate. The price for fat lambs has remained fairly steady during the week. Hogs made a slight advance. Cattle are the lowest for some time. Eggs have been advancing in price and are now up to 13 cents per dozen. Butterfat remains steady at 23 cents.

No further move has been made by the Great Western Sugar Company regarding the contract price for 1931. The Beet Growers Association are very busy in enlarging their membership. The association has from two to seven workers in each of the towns and adjacent beet dumps and states that they are meeting with success. It has been reported that some of the sugar companies in the Northwest have offered a $6.50 contract and that the Arkansas Valley growers have a $6.00 contract.

The activities at the Station have been confined to routine work.

James A. Holden

Yuma

Report for the month of February

The maximum temperature for the month of February was 81, mean maximum 72, minimum 33, and mean minimum 44. The mean temperature for the month was 58, greatest daily range 40, and precipitation 1.34 inches. These temperatures are above normal for the period and the amount of rainfall recorded is above the average.

The period of rainy weather from February 4 to 25, inclusive, was part of a general storm which covered the entire Southwest. In many localities cloudbursts were reported. The rain that fell at the station was more moderate. The heaviest precipitation was reported on the 12th with only .37 inch in the rain gauge.

The warm weather during this rainy period stimulated the growth of alfalfa and winter grains. The growth of these crops is several weeks ahead of normal. This kind of weather was detrimental

Yuma (cont'd)

to many lettuce fields that were just heading; on the other hand, it was a distinct advantage to some of the later lettuce plantings as prices were stimulated by these losses.

All cotton ginning on the project has been completed for the season. The total yield was approximately 29,800 bales. The plowing of cotton lands on the project has been somewhat slow, as many growers are having a little difficulty in obtaining financial assistance for the 1931 crop. As a result of the three bank failures on the project in 1930, in addition to the low prices of farm crops, many farmers have been closed out on account of indebtedness.

It is difficult to estimate the cotton acreage to be planted this year. There will undoubtedly be some reduction, but it is impossible to ascertain at this time just how much it will be.

Citrus shipments on the Yuma Mesa have been fairly steady. The associations which are packing the fruit are shipping as the orders are received. Approximately 60 per cent of the crop had been packed by the end of February.

Station work performed during the month of February included the ginning of cotton, plowing and leveling plots for cotton, cleaning and repairing ditches, pruning trees and ornamental shrubs, general irrigating and cultivating.

E. G. Noble

M I S C E L L A N E O U S

SALT BALANCE OF THE IMPERIAL IRRIGATION DISTRICT

For the past year this office, in cooperation with Mr. M. J. Dowd, Chief Engineer and General Superintendent of the Imperial Irrigation District of California, has been making analyses of the irrigation waters flowing into the Imperial Valley and of the drainage waters removed. Mr. Scofield summarized the results of these investigations in the following letter to Mr. Dowd under date of March 13.

"We have now completed the analyses of 52 sets of water samples representing the irrigation and drainage waters of the Imperial Irrigation District for the past year. The samples representing the irrigation supply have been taken each week at the Yuma gauging station by Mr. Ray Priest. You have reported each week the acre-feet of irrigation water crossing the International Boundary into the Imperial Irrigation District.

"Two samples of drainage water have been collected by you each week. One, representing the discharge of New River, has been taken from a station near the southwest corner of Section 27, T. 12 S., R. 13 W. The other, representing the Alamo River, has been taken at the North-End Dam near the northeast corner of Section 30, T. 12 S., R. 14 W. These stations for sampling the drainage discharge were chosen as being the lowest place on each drain where the discharge could be measured.

Salt Balance, etc. (cont'd)

"The discharge of each drain has been reported with each sample in terms of cubic feet per second. From this report I have computed the discharge of the drain as acre-feet for the week ending at the date of the sample. From these discharge data and the results of the analyses, the total dissolved salts having been determined by the evaporation of a filtered aliquot, I have computed the tonnage of salt carried into the district by the irrigation supply and the tonnage of salt removed from the district by the two drains at the points sampled. These results have been reported to you each week.

"The cumulative results for the 52 weeks from February 27, 1930 to February 26, 1931 are summarized in the following table:

	Discharge	
	Acre-feet	Tons salt
Irrigation water	2,646,914	3,212,967
Drainage water	1,067,821	2,112,190
Residue	1,579,093	1,100,777
Per cent residue	59.7	34.3

"This summary indicates that as an average for the year the irrigation water carried 1.21 tons of salts per acre-foot, which is equivalent to 892 parts per million, while the drainage water contained an average of 1.98 tons of salt per acre-foot, equivalent to 1454 parts per million.

"In addition to the determination of the total dissolved salts by evaporation for each sample, we have determined also the six principal constituents of these salts, viz.: Bicarbonate (HCO_3), chloride (Cl), sulphate (SO_4), calcium (Ca), magnesium (Mg), and the alkaline bases (AB), which represent chiefly the sodium.

"The sum of these constituents may be taken as one measure of the total salts, with the understanding that the total so obtained does not include such constituents as silica or nitrate or possible iron and alumina which are sometimes included in the analysis of water. Consequently, it is to be expected that the total salts as determined by the evaporation of a filtered aliquot, the gravimetric method, will be more than the total obtained by adding together the constituents or ions that have been separately identified.

"From the results of the detailed analyses I have computed for each week the tonnage of each constituent carried in the irrigation supply and in the drainage discharge, and by the addition of these the total tonnage of the constituents identified. This all makes an elaborate table covering 13 pages, and I will not burden you with it unless you desire to see it. I have taken off a summary of it for the year, which follows:

Constituents in Tons

	HCO_3	Cl	SO_4	Ca	Mg	AB	Totals
Irrigation	338,834	371,489	1,245,860	350,683	122,917	457,561	2,887,544
Drainage	157,415	503,108	851,105	195,877	78,936	382,099	1,968,540
Residue	181,419	-131,619	594,755	155,006	43,981	75,462	919,004
Per cent residue	53.5	-35.4	47.7	44.2	35.8	16.5	31.8

Salt Balance, etc. (cont'd)

"The outstanding feature of this table is the evidence it contains as to the difference in the character of the salts carried in the drainage water from that of the salts carried in the irrigation water. You will observe that the chloride content of the drainage water was so much higher than that of the irrigation water that during the year the drains carried away from the district 131,619 tons more chloride than was brought in by the irrigation water. On the other hand, the concentration of bicarbonate and sulphates was lower in the drainage water than in the irrigation supply. I assume that these differences are related to the lower solubility of calcium bicarbonate and calcium sulphate, in consequence of which these salts are to some extent precipitated from solution in the soil."

C. S. Scofield

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Mr. Carl A. Larson has been appointed to the position at Prosser, Washington, left vacant by the transfer of Mr. C. C. Wright to the Bureau of Indian Affairs. Mr. Larson has been at Prosser since the first of March.

The Congress which has just adjourned appropriated $35,000 to establish the Umatilla Field Station on a new site with adequate land and buildings. Negotiations have already been initiated for the acquirement of the land.

The following manuscripts, which are to be published as technical bulletins, have been submitted to the Bureau Editor: "Irrigated Crop Rotations in Western South Dakota," by Stephen H. Hastings and Beyer Aune; and "Crop Rotations and Tillage Experiments at the U. S. San Antonio Field Station, 1909-1929," by I. M. Atkins and Geo. T. Ratliffe.

Mr. James A. Holden, having spent several weeks in the Washington office, returned early in March to the Scotts Bluff Field Station.

W E E K L Y R E P O R T S

Of The Office Of

WESTERN IRRIGATION AGRICULTURE

(Not for Publication)

Vol. XXXIII March 14, 1931 No. 4

Huntley

The maximum temperature for the two weeks ending March 14 was 61, minimum 8, and precipitation .33 inch. Weather conditions continued favorable for field work during most of this period, and spring plowing and preparation of land for seeding is well advanced on the Project.

A small acreage of seed garden beans has been contracted for on project farms. This acreage is less than in previous years, one seed firm having withdrawn from the field. It is understood that this company is carrying over a rather heavy stock of seed grown in 1930 for which they are not able to find a market. A contract for sugar beets has not yet been given out, and there is no definite indication as to the probable prices for beets in 1931.

The local Water Users' Board is considering the matter of constructing a dam across the Yellowstone River at the intake of the Huntley Canal. In seasons of low water it is not always possible to fill the canal to capacity, and it is feared that the comparatively small amount of snowfall in the mountains during the past winter will probably result in unusually low water during the coming season. If the dam is built for the present season, it is likely that it will be of only temporary construction.

The work of installing the pump irrigation system for Field P is nearing completion.

Dan Hansen

Newlands

The average maximum temperature for the two-week period ending March 14 was 58.4, with a maximum of 68 on the 10th; the average minimum was 21.6, with a minimum of 9 on the night of the 6th; the average mean temperature was 40.0. The average hourly wind movement was 5.4 miles. There has been no precipitation during this period.

During the winter months the area of the station known as Y-6 to Y-23, inclusive, was plowed and releveled. A great deal of soil had to be hauled to make plots Y-11 to Y-19 level with the rest of the Y series. In all, some five or six acres were raised from one half to a foot in elevation. This work required the use of a tractor and scraper for a period of about four months. To finish raising the elevation of the B series of plots required two or three weeks' work with the tractor.

The brush has been removed from a virgin area lying between the Y and B series in preparation for straightening the Y irrigation ditch; but several weeks' work with the tractor and scraper is still to be done.

Newlands (cont'd)

The use of this outfit has proved to be a great deal more efficient and faster than the horse-drawn scrapers that were used a year ago.

Field plantings this spring have consisted of barley, sown on D-3, D-6, E-5, F-4, Y-19, Y-20, Y-21, Y-22, and Y-23; and wheat, sown on F-5, J-1, J-2, J-3, J-4, and J-5. The wheat plantings on the J series is a variety test of Spring Federation, Early Baart, Jenkins Club, and Little Club. The last five plots of the B series have been prepared for a variety test of alfalfa. The varieties to be used are Grimm, Cossack, Baltic, Peruvian, and Common.

A test is being conducted on H-2, 3, and 4 with phosphate fertilizer on old alfalfa. It has been fairly well established at this station that this fertilizer does not increase alfalfa yields. The test is being made to determine whether or not the phosphate content of the alfalfa hay can be increased by applying phosphate to the soil during the growing season. It is a well proven fact that the phosphate content of hay produced on this project, as a general rule, is below the normal requirements of the cows to which it is fed. If the phosphate content of the hay could be increased, there might be a beneficial effect on the constitution of the cow. Some authorities are inclined to ascribe many of our breeding troubles to a lack of phosphate.

A rather extensive pasture experiment is under way at the station and also on an area located in what is known as a community pasture. Several thousand acres in this pasture that are fenced are being irrigated with waste surface and drainage water. The feed now available is mostly native grasses and swamp growth. It was thought that the carrying capacity of this area could be greatly increased by seeding with some pasture grasses and clovers. In order to determine what pasture grasses are best adapted, an area of two or more acres is being carefully prepared and fenced to be used as an experimental area for plantings. Mr. Kephart, of the Office of Forage Crops and Diseases, visited this area, at our request, last fall. His office is taking an active part in this work, making suggestions and providing seeds of various pasture crops for these trial plantings. If these plantings are successful, some worth while information concerning this large area will be obtained.

The plantings at the field station will consist of small plots of 24 or more grasses or clovers. One area of about an acre will be planted to Ladino clover.

The cows in the State dairy experiment have about reached the desired size, and the experiment can again get under way as planned a year ago. All reactors to the abortion test have been removed. The young heifers that are freshening show promise of breeding regularly.

The State has purchased an alfalfa mill and is constructing a large building for storing the ground meal. It is important to determine the exact amount of hay eaten by each animal. This is the reason for grinding all hay and feeding each cow alfalfa meal.

During the past week the Superintendent and Mr. Headley spent two days at the Hawthorne Munition Plant. At the request of the Secretary of the Navy we went to Hawthorne, Nevada, to advise on types of soil and water in connection with landscaping the grounds. Plans were under way to landscape 18 acres, and the shrubs were already on hand. Tests run on soils and water showed them to be free of harmful

Newlands (cont'd)

salts. Suggestions were made as to methods of handling the sandy soils and as to the care of the plantings.

The analysis of waters in the boron survey, which consists of 25 test wells encased to a depth of 12 feet and located 600 feet apart on the entire 160 acres comprising the station, was undertaken in January and will continue indefinitely, the wells being sampled monthly. So far the results of the analysis indicate boron in varying quantities throughout the underground water, the highest amount being 6.43 p.p.m. in well No. 17. The January average for the 25 wells is approximately 1.90 p.p.m.

Since the beginning of the year many of the project farmers have brought water samples to the laboratory to have analyses made. On gallon samples a boron determination is made, so that some information is being obtained on the boron content of the underground waters throughout the project.

Early in the year the orchard was given a rather severe pruning in an effort to thin out the excess wood and to top the trees. This had not been done for several years and it is hoped that the trees may be benefited. There are about 240 trees, consisting of apple, pear, peach, plum, prune, apricot, and several foreign importations. As a whole they are in good condition and fairly resistant to disease and orchard pests. Due to the spring weather the Amygdalis Davidiana (ornamental peach) has blossomed about ten days earlier than usual.

E. W. Knight

Prosser

Report for week ending March 14

Farm work on the Station is progressing rapidly now. Two more fields have been seeded to wheat. The new Department of Agriculture cereal nursery has been planted with a number of varieties of seed wheat. One large alfalfa field has been disked and ditched. Irrigation ditches are being cleaned and the weeds along them burned.

Water has not been received at the Station yet, although it is expected at any time now. Water is being delivered to farmers surrounding the Station directly from the canal or another pump line.

During the winter of 1930-31 lamb-fattening experiments were conducted at the Station with the following feeding outline:

I. Corn, wheat, oats, and barley compared as feeds for fattening lambs.
II. Rolling and grinding barley, oats, and wheat compared to feeding the grains whole.
III. Long, chopped, and ground hay compared as feeds for fattening lambs.
IV. Feed value of cull potatoes, cull apples, and corn silage in rations for fattening lambs.

Potatoes were the most efficient both in total gain and in economy of gain. These results are in conformity with former trials at this Station.

The Yakima Valley received a rain amounting to about .45 inch March 10 and 11.

Carl A. Larson

San Antonio

Report for the two-week period ending March 14

Weather conditions during the first two weeks of March were favorable for field operations, and the work of preparing land and planting spring crops progressed satisfactorily. Drying winds which prevailed during much of the period rapidly dissipated the moisture from the surface soil, but did not seriously affect seed beds except in spring-plowed plots. At least a light shower will be necessary to insure germination on most of these late spring-plowed plots. Rotation plots of corn, milo, hay sorghum, and Sudan grass have been planted.

Soil moisture sampling for this season was started March 7. The first spraying of all orchards and vineyards was completed. Repairing of station buildings, made possible by the special appropriation for the relief of unemployment, was practically completed by the end of the period.

The following is a summary of the meteorological data recorded during the two weeks:

Week ending	Temperature						Precipitation	Aspect of the sky		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean						
							Inches	Days	Days	Days
March 7	72	66.4	31	36.9	51.6	38	.02	5	1	1
" 14	77	70.7	28	43.7	57.2	38	.11	3	2	2

Geo. T. Ratliffe.

Scotts Bluff

The average maximum temperature for the week ending March 14 was 55°, with a maximum of 63 on the 12th; the average minimum was 23, with a minimum of 15 on the night of the 8th. The average wind movement was 8 miles per hour. No precipitation was recorded during the week.

The precipitation has been considerably below normal for the first three months of 1931. There is very little moisture in the ground.

It is expected that work in the fields will begin next week if weather conditions remain favorable. The corrals and feeding yards, except the sheep pens, are about cleaned out.

The shrubs and trees have been pruned and cleaned out. Plants have been started in the hothouse for the variety tests in garden work, and test plots have been arranged for some extensive work of this kind. Old shrubs around the office building have been removed and a new plan of plantings has been formulated.

The price committee of the Beet Growers' Association has been called to a meeting in Denver next week to discuss the 1931 beet contract. It is understood that the Great Western will be ready to announce their contract price during that week, and a conference between the two organizations will take up the matter. The Holly Sugar Company has announced a price of $5.50 with an additional payment of 50 cents per ton July 1, 1932, based on sugar prices for the coming year.

The prices of farm products are gradually working up. Lamb prices are making slight gains each week. There were 124 cars shipped

Scotts Bluff (cont'd)

out of the valley at the end of the week. During the week prices have advanced to as high as $8.85 at Omaha. The top for lambs from this section has been $8.75; but the feeder receiving this price paid only 5 cents for his lambs, so that he has made a good profit. Potatoes are slowly advancing, No. 1's now being quoted at 95 cents to $1.05 per hundred. Eggs have advanced 2 cents per dozen and sour cream is now bringing 25 cents per pound. The cheese factory has been paying 30 cents per pound for butterfat in whole milk. The price for March has not been fixed. Hay and the grains have not shared in the advance, however. Hay is bringing about $5.00 a ton and barley and corn 60 cents and 90 cents, respectively, per hundredweight.

James A. Holden

Yuma

The maximum temperature for the two-week period ending March 14 was 87, minimum 30, greatest daily range 48, precipitation 0. The rather abrupt drop in temperature on the night of the 6th caused some damage to tender growth on citrus trees. Apricot orchards and strawberry fields were also injured. The extent of the injury reported indicates that the temperature was very much lower than 30 in some sections of the project. A temperature of 31 was also recorded on the night of the 7th. The stand of a planting of bean varieties on this station was injured approximately 50 per cent by this freeze.

The harvesting of the first cutting of alfalfa for the season was begun following this low temperature. Up to that time the weather had been unusually mild, and this first crop of alfalfa had made a very good growth. Hay prices are still low, and very little of it is moving at the nominal prices of $7.00 in the stack and $10 or $11 baled and on board cars. There will undoubtedly be a large carry-over of alfalfa seed from the 1930 season. The normal local demand for seed at this time has failed to develop. The prices quoted at present are around 15 cents per pound.

Various estimates of the reduction in the project cotton acreage this year vary from 20 to 50 per cent. Many farmers are reducing their acreage voluntarily, while others are having difficulty in being financed. The varieties grown probably include the usual percentage of Mebane, Lone Star, and Acala. The interest in the latter variety is more evident than in some previous years. Seed of this variety is being obtained from the Coachella Valley.

Station work performed in the last two weeks has included planting of Pima cotton in the irrigated rotations, harvesting the first cutting of alfalfa hay on series B and D, building fences for hog pastures, pollinating dates, ginning cotton, cleaning and repairing ditches, and general irrigating and cultivating. Thirty small lots of alfalfa seed (with F. P. I. numbers) were planted in a nursery plot.

E. G. Noble

W E E K L Y R E P O R T S

Of The Office Of

WESTERN IRRIGATION AGRICULTURE

(Not for Publication)

Vol. XXXIII March 21 and 28, 1931 No. 5

Belle Fourche

Under date of March 24 Mr. Aune reported as follows:

"Some field work has been done this month: leveling in field I, discing in field A, and plowing in field B. There have been some light snows and showers, which have greatly retarded the field work.

"Two carpenters and two laborers started repairing the mess house on the 10th, and the work is now about one-fourth completed.

"During the first part of the month the Black Hills Sugar Company held well-attended meetings at Spearfish, Fruitdale, Nisland, Newell, Vale, and Rapid City on sugar beet culture. This company finally offered a minimum contract price of $5.50 a ton, with a sliding scale if the price of sugar should go up. The growers are not satisfied with the price, but I think they will sign up a fairly good acreage, as there is nothing at this time that looks any better.

"Lambing is practically completed.

"The South Dakota legislature appropriated $2,000 for work at this station in cooperation with the State College."

Huntley

Field work was interrupted during the week ending March 28 by cold, stormy weather. There were several days of high winds and minimum temperatures near zero. A light snowfall occurred, but it was not sufficient to be of much benefit to the soil. The maximum temperature recorded during the week was 69, minimum zero, and precipitation .2 inch.

The terms of the 1931 beet contract were announced on March 19. Under this contract, local growers are offered a minimum price of $6.00 per ton. The contract contains the usual sliding scale feature in which growers will be paid additional amounts should high sugar content of beets and the selling price of sugar permit. The beet growers' organization at first did not accept the contract as offered, but it is understood now that association members have been released from their agreement with the association to restrict acreage and that they will deal directly with the Sugar Company. While there is no definite indication yet as to the probable beet acreage, it is likely that the usual amount of beets will be grown since other farm products are correspondingly low in price.

Great Northern beans are quoted at $2.40. Alfalfa hay is selling at $8.00 per ton in the stack, and butterfat is bringing 26 cents per pound.

Wool buyers have not yet entered the field, and so far as known no wool clips have as yet been contracted for.

Dan Hansen.

Newlands

For the two-week period ending March 28 the temperatures were as follows: maximum 77 on the 21st, mean maximum 62.9, minimum 18 on the night of the 26th, mean minimum 29, mean 45.9. The average hourly wind movement for the period was 7.8 miles, and the precipitation was .06 inch.

The field activities during this period have consisted of the usual spring work. Levees have been built on the area Y-6 to Y-19, inclusive, and the resulting plots leveled. As soon as irrigation water is available these plots will be irrigated and the final leveling done. It is planned to manure and disc the entire area, then seed to ensilage corn. The soil of the filled area tends to cement upon drying; to prevent this and maintain a suitable seed bed for the corn it was decided to apply manure.

All irrigation ditches and drains have been cleaned by using a ditching machine and tractor. Some repairs and a few new irrigation box structures were necessary.

Numerous repairs are being made to station buildings. This work is being done under the provisions of the unemployment relief bill, passed by the last Congress. All the buildings are receiving a much needed exterior coat of paint. The mess house has been generally repaired and the interior painted. Besides the repairs being done by the Federal Government, the State has just finished constructing a barn 20 by 30 by 14, with a concrete floor. This structure is to be used to house the alfalfa meal that will be ground for the dairy-feeding experiments.

The water situation of the project at present is similar to the season of 1929 when there was a rather acute shortage. The late March storms in the mountains, however, may materially increase the irrigation supply.

The continued good weather has caused the apricots and peaches to blossom about a week earlier than usual. In spite of the low temperature of 18° there are no indications that the blossoms have been injured by freezing.

The orchard and ornamental trees near the station buildings received their first spraying this season on March 23 and 24. An application of lime sulphur at the rate of 12 pounds to 100 gallons was made, using Kayso as a spreader. As light oils are considerably cheaper and seemingly just as beneficial, some may be applied with future sprayings. The European elm scale is in evidence on the American elms and also on the Chinese variety again. Whether the lime sulphur can check it or not remains to be seen.

The laboratory work on test well waters of the station still continues, and rapid progress is being made in the collection of data on boron as well as on other salts for the entire project.

E. W. Knight.

Prosser

Report for week ending March 21

The pump line which supplies water to the station was filled March 16. On account of several serious leaks the pumping plant was closed down in order to repair the pipe line; consequently, no irrigation water was available to the station during the past week.

Prosser (cont'd)

All of the earthen ditches on the station have been cleaned of weeds and brush. The flumes that are to be used first have been cleaned and repaired.

The water meters have been placed at the station headgates and in the turn-out for the sweet clover field on which the water is to be measured. The measurement of surface run-off water has been planned for the orchard irrigation plots, sweet clover field, and a large alfalfa field.

Soil moisture samples were taken from a wheat and sweet clover field to a depth of 4 feet. Arrangements were made in the laboratory for handling large numbers of these samples in the near future. Soil sampling equipment was also prepared for use.

Irrigation plot experiments are being planned similar to those conducted by C. C. Wright. His results on these plots for the last few years are being studied.

The maximum temperature for the past week was 65.5° and the minimum 31.5°. The greatest daily temperature range was 32°. During the week .46 inch of rain was received. The weather data for the winter months of 1930-31 are being calculated.

Report for week ending March 28

Irrigation waters were received at the station March 23; and two fields of newly seeded sweet clover, several small pastures, and one field which is to be planted to corn have been irrigated. A box 6 feet long, 3 feet wide, 3 feet deep, and divided into three compartments was installed in the draw at the southeast corner of field A-7 to measure the run-off water accurately.

A reduction of 40 per cent in the normal irrigation water deliveries has been proposed by the Bureau of Reclamation and is favored by representatives of the valley irrigation areas. The available supply of irrigation water in storage is 402,000 acre-feet for this season against an estimated requirement of 645,000 acre-feet, and an additional 46,720 acres of land to serve in the Kittitas Project. Certain deliveries are necessary to the Wapato and Sunnyside divisions and can not be pro rated.

One acre of orchard was planted to the following varieties: 13 plums, 2 plumcots, 4 cherries, 5 peaches, and 3 nectarines. These are all new varieties for trial. This makes a total of 31 plum varieties and 18 peach and nectarine varieties planted. A dormant oil spray was applied to the orchard.

The maximum temperature for the week was 58.5°, the minimum 26°, and the greatest daily range 31°.

Owing to the freezing temperatures, orchardists were forced to heat their orchards in this district.

Carl A. Larson

Scotts Bluff

The average maximum temperature for the week ending March 21 was 61°, with a maximum of 69 on the 16th; the average minimum was 29, with a minimum of 21 on the night of the 19th. The average hourly wind movement was 8.4 miles. There was a trace of rain on two days.

Plows were started this week, and the sweet clover pasture in field E and the bean variety test plots in fields E and H were com-

Scotts Bluff (cont'd)

pleted. All of the fall-plowed plots in fields K and E (irrigated rotations) were harrowed.

The painting and repair work on the buildings is well under way.

The Great Western Sugar Company announced a price of $5.50 per ton, with an additional payment up to 50 cents per ton for volume production. The growers, both in the Colorado and Nebraska districts, refused the terms of the contract and will submit their terms soon, but little time remains for such a discussion. Many growers are planning to replace their beet acreage with potatoes if a better contract cannot be secured. The bankers of the sugar beet districts will hold a meeting at Greeley, Colorado, next week to consider the matter. They have indicated that under a contract of $6.00 or less they would be able to finance only a small percentage of the growers.

Prices for fat lambs continue to advance. About the usual number of lambs were shipped out this week. Some valley lambs have sold as high as $9.10 at Omaha. The price of potatoes advanced during the week, and No. 1's are now up to $1.40. There is a strong and early demand for seed stock, but so far no prices are being quoted. There will be an increased acreage in potatoes in the valley according to present indications,

The average maximum temperature for the week ending March 28 was 37°, with a maximum of 66 on the 22d; the average minimum was 11, with a minimum of 7° below zero. The average hourly wind movement for the week was 15.4 miles.

The valley received a small part of the storm that was very severe in some parts of the mountain states. For the first time during the winter of 1930-31 the temperature went below zero. The week was ushered in with a wind that averaged about 23 miles per hour. There were about 8 to 10 inches of snow accompanied by high winds that lasted most of two days. Part of the precipitation was in the form of rain, which was followed by snow; so that it was impossible to get a correct reading of the precipitation. The measured amount was .64 inch, but there was nearer an inch and possibly more. Roads were blocked, but traffic was suspended in this section for only a day.

About the only work done at the station was taking care of the stock, as the high winds the first of the week and the storm that followed made it impossible to do any work in the fields. Just prior to the storm the steers that have been on beet tops in Mitchell Valley were brought to the station. This was made necessary by the fact that two of the steers were taken sick with some form of poisoning.

The Mountain States Beet Growers' Association, at their meeting held in Greeley, Colorado, on Saturday, voted to release their growers and allow them to make contracts with the sugar company for the ensuing year They did not approve the contract offered by the company, but thought it best to allow members to use their own judgment about signing up. They expressed the belief that all growers would lose money on the contract.

Potato prices are holding up, some seed stock selling as high as $2.00 a hundred. Butterfat prices are off 2 cents, but eggs have made an increase of 2 cents during the week.

James A. Holden

W E E K L Y R E P O R T S

Of The Office Of

WESTERN IRRIGATION AGRICULTURE

(Not for Publication)

Vol. XXXIII April 4 and 11, 1931 No. 6

Huntley

During the week ending April 11 the maximum temperature was 80, minimum 25, and no precipitation. High winds on three days resulted in drying out the surface soil on fall plowed land and in much drifting of the soil.

Station work during the week included the preparation of dry lands and of beet plots for seeding. Seeding of dry-land grains was begun.

The sugar beet acreage contracted for in the Billings factory area amounts to 31,000 acres, which is an increase of more than 25 per cent over the amount in any previous season. Applications for additional acreage are being refused by the Sugar Company.

It is reported that superphosphate fertilizer will be used on practically all of the beet acreage. Seeding of beets was begun in various parts of the valley during the week.

Dan Hansen.

Newlands

The average maximum temperature for the two-week period ending April 11 was 69, with a mean maximum of 77 on March 31 and again on April 6; the average minimum was 31.2, with a mean minimum of 18 on the night of the 3d. The mean temperature was 50. The average hourly wind movement was 7.7 miles. There was no precipitation during this period.

The field work during this period has included planting, repairing ditches and irrigation boxes, and one irrigation. Plots B-18 to 22, inclusive, have been seeded to wheat, which will serve as a nurse crop for a later planting of alfalfa. Plots B-2, 3, and 4 have been seeded to Ladino clover, which will be used later as pasture for cows. Twenty-two grasses and clovers have been planted in small plots west of the office building. These will be used as demonstration plots to determine what grasses and clovers are best adapted for pasture crops in this locality.

The first irrigation has been given, but to help conserve water all of the farm area was not irrigated at this time. The plots that are to be seeded to grain or had been seeded were irrigated. Plots Y-11 to Y-18, inclusive, are receiving a heavy application of manure. This is the area that was raised some 12 inches with sand during the winter. The filled area was inclined to bake, forming such a hard surface that the plants would not come through. To change this condition manure is being added before planting to ensilage corn.

All Federal buildings at the station have been painted. The State is planning to paint all the dairy buildings and to lay some concrete walks and feeding floors.

E. W. Knight.

Prosser

Report for week ending April 4

Six hundred and eighty-nine pear trees have been obtained and will be planted on 7.7 acres just south of and adjoining the apple orchard. The following pollination work will be conducted in cooperation with the State College:

1. Using seven different kinds of pollen on the J. H. Hale peach.
2. Experimenting with the Bing, Lambert, and Royal Anne cherries.
3. Working with the d'Anjou pear on fertilized and unfertilized plots.

One hundred and fifty orchard heaters were purchased and set up to heat 6.4 acres of apple orchard as a safeguard against frost injury.

All the lambs fed on contract during the winter have been returned to their owners. Fifty-four hogs were sold, bringing $7.50 per hundredweight at the farm.

Alfalfa is about 4 to 6 inches high and most of it has been irrigated. Wheat seeded the first of the season is about 2 to 3 inches high. Owing to intermittent showers the moisture condition in the surface foot of soil is very good.

The weather for the month of March was as follows: Mean maximum 57.7, mean minimum 32.2, mean 45.9; total precipitation .765 inch; hourly wind velocity 2.74 miles. An additional .085 inch of rain fell the first part of April.

Mr. H. K. Dean of the Umatilla Field Station and Dr. Overholser of Washington State College visited the station recently.

During the week ending April 11 the maximum temperature was 69°, the minimum 30.5, and the greatest daily range 34. There was .13 inch of rain.

Owing to a break in the 34-inch pipe carrying water to Prosser, the pump supplying water to the station was shut down from April 9 to 12.

The spring work is progressing rapidly. Fields are now being prepared for corn. The new pear orchard will be seeded to corn between the tree rows.

Plans are being made for a new concrete meter box at headgate No. 1 to connect with the new metal flume on the north side of the orchard. This will supply an accurate measuring device for orchard irrigation.

Eighty soil samples for moisture determinations were taken on sweet clover and alfalfa fields. The water-holding capacity of most of these samples was determined.

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the week ending April 4 was 44°, with a maximum of 63 on the 1st; the average minimum was 23, with a minimum of 16 on the night of the 3d. The average hourly wind movement was 8.5 miles. No precipitation occurred during the week; and no evaporation data was taken, as the tank was full of ice and snow until the end of the week.

During the week the plots in the fertilizing tests in series I and II, field E, were plowed; and additional plots in field E were staked out to provide some rotations in which beans are to be used.

Scotts Bluff (cont'd)

The growing of beans is becoming a major industry in the valley, and these tests should be of value to the growers. A plant for the cleaning and grading of beans has been established at Morrill. It employs about 30 women, and for several months it has operated a day and night shift. It probably handles the major portion of the bean crop produced in the valley, and from present indications the acreage of this crop will be considerably larger this year than in the past.

The Beet Growers' Association in the valley did not approve the contract offered by the Great Western Sugar Company; but, according to the laws of the association, when a contract is not accepted by April 1, the members are released and are allowed to grow 70 per cent of the last year's acreage. The association has asked for a congressional investigation of the methods of the division of profits.

On Saturday, April 4, the Great Western Sugar Company instructed its field men to cease writing contracts and since that time no effort has been made to sign up acreage.

The State legislature is considering a bill that defines the method of taring the beets and topping them. Another bill was introduced providing for the appropriation of a sum of money to employ a chemist to test for sugar content, but it was determined that this could be done through the State Agricultural Department.

The prices of all products remain about the same. There is a growing demand for potato seed stock, but no market price has been established as yet.

The average maximum temperature for the week ending April 11 was 69°, with a maximum of 80 on the 11th; the average minimum was 32, with a minimum of 20 on the night of the 8th. The average wind movement was 8.2 miles per hour. The evaporation tank was drifted full of snow and frozen until the 6th. The evaporation for the six days amounted to .925 of an inch or a daily average of .154 inch. There was no precipitation during the week.

During this period all of the shocked corn in the fields was hauled and put in the silo. Two of the silos had been emptied and there was enough corn to fill both of them nearly full.

Some plowing has been done on the new Walker tract, and plots have been laid out to carry on some depth-of-planting tests for sugar beets.

Weather conditions have been excellent, and throughout the valley the farm work is well advanced. A good deal of grain has been seeded and some beets have been planted. Seed had been issued on some of the early contracts, and the recent order of the sugar company to write no more contracts did not affect these early ones. The bill before the Nebraska legislature relating to the manner of taking tare was indefinitely postponed by the House, and it is believed that the writing of contracts will be resumed next week. In the Holly district in Wyoming, and in the Great Western in Colorado and at Wheatland in Wyoming, the association imposed no restrictions as to acreage on the growers when they were released April 1, and the acreage in those sections is reported to be showing a considerable increase. In the Nebraska district, however, the growers are limited to 70 per cent of the acreage grown last year.

Scotts Bluff (cont'd)

Corn stover and corn grown on Field K in 1930:

Rotation	Stover, tons per acre	Corn, bushels per acre
6	0.76	22.4
32	1.40	38.1
62	1.60	66.7
16	.78	28.6
26	1.24	27.3

James A. Holden

Yuma

The maximum temperature for the week ending April 11 was 94, minimum 44, and greatest daily range 50. No precipitation was recorded. The weather, in general, during the past week has been very favorable for growing crops. The nights are still quite cool, but the absence of high winds has offset this coolness.

Cotton is still being planted on the project, but most of the acreage is now in. Early plantings are up to a good stand and are now being cultivated. Reports on the cotton acreage indicate a decrease of around 20 per cent, making about 25,000 acres on the project for 1931. Of this acreage it is estimated that about 80 per cent will be financed by two of the large cotton finance companies. There has been a little interest shown recently in the production of Pima cotton on this project. This interest, however, developed rather late and it now seems that nothing will be done in the way of planting long staple cotton until next year.

The Pima cotton on the station is all up to a good stand and is now being cultivated for the second time. The early planted barley plots are ripening and the later plantings are now in the heading stage.

Station work performed during the week included cultivating and hoeing cotton, pollinating and trimming date palms, removing trees from the old "B" orchard, repairing roofs, painting station buildings, cleaning ditches, general irrigating and cultivating.

E. G. Noble

W E E K L Y R E P O R T S

Of The Division Of

WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this office)

Vol. XXXIII April 18, 1931 No. 7

Huntley

(Note: This report was inadvertently omitted from the previous issue.)

The maximum temperature during the week ending April 4 was 58, minimum 10, and precipitation .39 inch. The total rainfall of the week, which occurred mainly as snow, was the heaviest single storm in recent months. This storm was general over the State and precipitation was reported to be much heavier in other sections, particularly in the mountain regions where the added snowfall will benefit the season's water supply. The total rainfall at the station during the five months November to March, inclusive, was but 1.85 inches.

The seeding of grains was begun on the project during the week, and good progress was made in preparing land for beets. Indications are now that a record acreage of sugar beets will be grown this season and that probably more than 25,000 acres will be used for this crop in the Billings factory area.

Practically all of the alfalfa hay on the project has been sold and there will be none carried over. The price has ranged from $8 to $10 per ton. The price of butterfat has dropped during the week from a top of 26 cents to 21 cents per pound. Great Northern beans are quoted at a steady price of $2.50 per hundredweight, and fairly large stocks are still carried on farms and in warehouses of the growers' association.

The maximum temperature during the week ending April 18 was 80, minimum 28, and precipitation .30 inch. Conditions were favorable for field work during the entire week. Seeding of the dry-land rotation plots and of beets and wheat in the irrigated rotations was completed. While the soil is in fairly good condition to work, there is insufficient moisture for seed germination; and unless rain occurs soon, irrigation to start crops will be necessary.

It is planned now to have water in the canals by May 1. There has been some delay in getting water due to the necessity of making extra repairs on the irrigation system and enlarging the main canal from the intake to Huntley, a distance of four miles.

The seeding of beets and grain on the project is well advanced, and farmers are preparing to use irrigation water as soon as it becomes available.

Many farmers who have not grown sugar beets in recent years, or who are farming lands that are not considered to be in good condition for beets, have been unable to obtain contracts from the Sugar Company. This situation is said to be due to the fact that the company has already accepted contracts for the maximum amount of beets that can be handled at the local plant.

Huntley (cont'd)

The price of Great Northern beans remains steady at $2.40 to $2.50 per hundredweight. Butterfat sold at 20 cents during the week. Alfalfa hay is selling at $8 to $9, there being apparently a local shortage, some farmers having oversold earlier in the year.

Dan Hansen.

Prosser

Report for week ending April 18

Because of cold weather the snow has been melting so slowly in the mountains that not enough water is in the Yakima River for irrigation requirements, so storage water has been drawn upon. In normal years storage water is not used until about June 1.

Soil sampling for moisture determinations has been continued the past week. Fifty moisture determinations to the sixth foot level are being made on each orchard plot, which consists of two panels and three rows of trees. In order to connect up soil moisture conditions with the rate of transpiration 30 samples were taken on all sides of a representative tree of the plot on which transpiration work is to be done. The water-holding capacity of these samples was also determined. Later it is planned to determine the wilting point of these soils.

The young pear trees have been planted and irrigated. The Mabton alkali plots were cleaned of weeds and thoroughly worked up with a spring-tooth harrow. The plots on which sulphur and calcium sulphate were applied have a stand of sweet clover on the high places where the water did not stand after the flood irrigation. The plots have been ditched, the ditches being 30 inches apart, and each plot will receive a small amount of water at frequent intervals.

A comparison of the number of carload shipments of fruits and vegetables from the Yakima Valley for the years 1930 and 1931 follows:

	1930	1931
Apples	11,391	16,056
Mixed fruit	1,680	1,751
Pears	2,899	4,539
Onions	616	652
Potatoes	6,304	5,878
Vegetables	727	407
Other crops	2,976	2,234
Total	26,493	31,607

Prices of farm products on April 19, 1931: Hay, $9 to $10 per ton; potatoes, combination grade, $14 to $15 per ton; wheat, 54 cents per bushel; eggs, standard size, cases included, 19 to 21 cents per dozen; butterfat, 21 cents per pound.

The maximum temperature was 75°, the minimum 25, and the greatest daily range 38. Rain, .19 of an inch. The cool temperatures of the past week have caused the fruit growers to use their orchard heaters.

Carl A. Larson

San Antonio

(Note: This report was not received in time to include in the previous issue.)

The following meteorological data were recorded for the four-week period ending April 11 and for the month of March:

Week ending	Temperature						Precipitation	Aspect of the sky		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean						
							In.	Days	Days	Days
March 21	77	70.6	38	46.1	58.4	30	2.41	3	2	2
" 28	85	72.7	34	46.0	59.4	33	.26	5	2	0
April 4	88	74.7	36	44.7	59.7	36	.14	4	2	1
" 11	82	74.4	38	46.9	60.6	33	--	4	0	3
Month of March	85	70.0	28	42.9	56.4	38	2.93	18	8	5

The mean temperature for March was 5.6° below normal, although no extreme minimums were experienced. Rainfall for the month was about an inch more than normal. The accumulated rainfall for the first quarter of this year is 10.92 inches—a surplus of 6.27 inches. A late cold spell was climaxed the night of March 27 by a recorded minimum temperature of 34°. A heavy frost occurred in all low-lying sections, and some damage was done to tender truck crops and early planted cotton. Tips of corn leaves were nipped, but no appreciable damage resulted. Only a few reports of slight damage to fruit buds in the San Antonio section were noted.

All orchards and vineyards were sprayed March 17 and 18. The last planting of flax in the date-of-seeding test was made April 2. Cooperative cotton plantings for the Bureau of Chemistry and Soils, under the direction of Mr. Paul R. Dawson, were made March 31 and April 1. Rotation cotton plantings were made April 6 and 7. Cotton was planted April 8 and 9 for the experiments of the Division of Cotton, Rubber, and Other Tropical Plants. Other cotton plantings for the study of cotton rootrot were made in fields C-5 and C-6 on April 10 and 11.

Sunflowers were pulled by hand from the new 8.25-acre alfalfa field located in field ABC-7.

Official visitors during this period have been: Paul R. Dawson, Bureau of Chemistry and Soils, March 19; D. C. Neal, Cotton, Rubber, and Other Tropical Plants, March 26 to 28; Paul R. Dawson and J. H. Hunter, Bureau of Chemistry and Soils, March 31 to April 1; Wm. P. Snyder, Cotton, Rubber, and Other Tropical Plants, April 8 and 9.

Geo. T. Ratliffe.

Under date of April 18 Mr. Ratliffe reported as follows:

"Prospects now point to a very good season here. Oats are heading rapidly, and only a very light infestation of leaf rust is manifest at this time. The growth is rank in most plots, however, and should a period of wet weather set in, the rust would no doubt spread rapidly and ruin otherwise rosy prospects. Wheats and barleys in the small grain variety test are also heading. Some varieties of wheat are very heavily infested with leaf rust while others are only slightly infested. On only one variety—Dixie—has stem rust been found. Bumper flax

San Antonio (cont'd)

yields are indicated except on a few plots where the stands are too thin. Excellent stands of corn, sorgo, and grain sorghums have been obtained in all plantings. Corn thinning, except a small plot on the Herbst tract, was completed yesterday. Most of the cotton plantings have emerged to good stands. A few plots have not had time to emerge, some of the spring-plowed rotations being slow because of the loose, lumpy condition of the seed beds.

"A period of very favorable weather has made it possible to get station work practically up to schedule."

Scotts Bluff

The average maximum temperature for the week ending April 18 was 73°, with a maximum of 81 on the 13th; the average minimum was 39, with a minimum of 34 on the night of the 15th. The average wind movement was 8.4 miles per hour. The precipitation amounted to .04 inch, being the first recorded for the month. The total evaporation amounted to 1.439 inches.

The week has been very favorable for field work, and most of the land in the Walker tract has been plowed and prepared. Some alfalfa and sweet clover have been seeded on that tract, and plots have been prepared for time-of-planting, depth-of-planting, and amount-of-seed tests with sugar beets. The first planting has been made.

The sweet clover pasture plot in field C was seeded during the week.

The 120-day feeding test for the lambs ended on the 14th; but as the lambs were very light when put in the feed lots, they had not made sufficient gains to warrant marketing them and they will be continued on feed for awhile longer. At the end of the period the lambs averaged 75 pounds in weight, which was a very satisfactory gain.

The Great Western Sugar Company began writing contracts at the end of the week. While it is rather late to begin seeding, the delay has not caused any great loss, for the few beets that were planted early have not germinated and the later planting will probably emerge as soon as the early planting.

Lamb prices continue to make slow gains, the Omaha top at the end of the week being $9.40. It is estimated that there are about 60,000 lambs left in the Scotts Bluff section.

James A. Holden.

Yuma

(Note: This report was inadvertently omitted from the previous issue)

Report for the three-week period ending April 4

The meteorological data for the month of March show that the maximum temperature was 96, mean maximum 82, minimum 30, mean minimum 44, mean 63, greatest daily range 49; killing frosts on the 7th and 8th; precipitation 0. According to the Weather Bureau station at Yuma, March was 2.2° warmer than one year ago. So far, the average for the year has been 1.5° above normal.

The discharge of the Colorado River at Yuma for the month was 336,400 acre-feet. This is the lowest recorded for March over a 39-year period, the average being 893,000 acre-feet.

The weather in general has been very satisfactory for the growth

Yuma (cont'd)

of alfalfa and the planting of cotton. Cotton planting continues; over half of the crop is already planted. This year there will be approximately 25,000 acres of cotton on the project. This is a reduction of about 25 per cent.

Alfalfa hay prices remain very low, and very little of it is being sold at $10 and $11 baled and on board cars. The alfalfa seed market is very inactive, indicating that there will be a large carry-over of the 1930 crop.

Station work performed during the past three weeks has included the cultivating of cotton, the harvesting of the first cutting of alfalfa hay, removing and transplanting trees from the old orchard, pruning and pollinating date palms, painting farm buildings, repairing the station pipe lines and water system, cleaning ditches, general irrigating, cultivating, and hoeing.

The maximum temperature for the week ending April 18 was 96, minimum 47, and the greatest daily range 45. No precipitation was recorded.

The absence of high winds has been a distinct benefit to the planting of cotton and also to the condition of the plants already up. The spring weather so far has been very favorable.

The cotton, citrus, and pecan growers on the Arizona side of the project are very much concerned about Governor Hunt's veto of that portion of the State appropriation bill which provided funds for the plant quarantine department. The drastic cut in the appropriation for this work indicates that there will be insufficient funds to maintain several of the border stations. Several conferences have been held at the Governor's office about this situation. The Yuma delegations have been promised that protection will be given to this territory, but the local people are still very much worried.

The work of painting and repairing the station buildings, under the emergency appropriation for the relief of unemployment, was completed during the week. All shingle roofs have been painted and the exteriors of the mess, tool, and date houses. Eradication work has been started on the two patches of running mesquite on series E. The large specimens of mesquite varieties are being removed and the land is being given a deep plowing. As each furrow is opened, all the roots are being removed from the soil. Other station work performed has included the pruning and pollinating of date palms and the removal of all old fruit bunches and old stems. The short ditch on the A-10 series was plowed and shoveled.

Mr. T. H. Kearney visited the station on the 16th and 17th.

E. G. Noble.

M I S C E L L A N E O U S

The Chief of the Bureau of Plant Industry, under date of April 22, addressed the following memorandum to Heads of Offices:

"In the interest of simplification, the Office of the Secretary has suggested the standard use of the term "Division" to designate units reporting directly to the Chief of Bureau. It is believed that the use of this term generally will be helpful to people outside the Department in understanding references to branches of the Bureau, whether appearing in publications or in correspondence. Accordingly, hereafter all branches of the Bureau heretofore referred to as offices or laboratories will be known as Divisions. This terminology to be uniform should be used in connection with letterheads, correspondence generally and in all printed matter where the title of the unit is used."

W E E K L Y R E P O R T S

Of The Division Of

WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

Vol. XXXIII April 25 and May 2, 1931 No. 8

Belle Fourche

Report for the month of April

The temperature during April was just about normal. The maximum was 84° on the 18th and the minimum 14 on the 23d. From the 20th to the 28th, inclusive, the temperature was below freezing every night. The precipitation for the month was only .47 of an inch, which is 1.02 inches below normal. The weather was very favorable for all kinds of field work, and all the crops are in good condition.

The grains in the dry land rotations were planted April 7 to 9; field K, April 14; variety grains, irrigated rotations, fields I and Y, April 15, 16, and 17. Alfalfa, sweet clover, and red clover were planted in field A on the 20th. The planting of sugar beets was completed on the 28th. Mr. Hurst was here on April 30 and planted the sugar beets for the fertilizer experiment.

At the present time some 8,250 acres of sugar beets have been contracted for the district and 10,000 acres are expected before the end of the season. So far about 5,000 acres have been planted. The contract price is $5.50 a ton, with the usual sliding scale if the price of sugar goes up. The wages of both contract and farm labor on sugar beets have been reduced 20 per cent from last year. Many laborers are still without work.

The prices of farm produce are the lowest for the past 20 years. The average price of butterfat is 16 cents, eggs 10 cents a dozen in trade, wheat 48 cents a bushel, oats 90 cents a hundred, and barley 80 cents a hundred.

Beyer Aune.

Huntley

The maximum temperature recorded during the week ending April 25 was 59, minimum 13, and a trace of precipitation. Dry weather continued during the week, with minimum temperatures below freezing each day and two days of high winds. In most places soils do not have enough moisture for seed germination and preparations are under way for irrigating crops "up." Water for irrigation on the project will be available on May 1.

Loss of beet stands from frost injury is reported from some parts of the valley where beets were seeded early and where the soil moisture was sufficient to bring about germination.

In the dry-land area adjacent to the project it is reported that winter wheat has been damaged by wind and dust storms.

The seeding of beets, alfalfa, and grains was completed on the station.

The price of Great Northern beans held steady at $2.50 per hundredweight during the week. Butterfat dropped to 18 cents per pound and eggs are selling at 12 cents.

Dan Hansen

Newlands

The average maximum temperature for the two-week period ending April 25 was 66, with a mean maximum of 80 on the 17th and again on the 21st; the average minimum was 35, with a mean minimum of 27 on the night of the 14th. The mean temperature was 50. The average hourly wind movement was 6.2 miles. The precipitation was .45 of an inch. There were snow flurries on the 23d and 24th, the snow melting as fast as it fell.

The field work has included construction of new bridges, a new irrigation ditch, the continued use of the tractor in leveling the new area west of the F series, and one general irrigation on the 20th and 21st. Practically no seeding has been done except a small portion of the garden.

The State of Nevada, in cooperation with the U. S. Department of Agriculture, will begin some pig experiments on April 28. About 32 pigs will be placed on pasture lot.

The State dairy buildings are receiving a much-needed coat of paint this week, rainy weather having set the work back a few days.

All fruit trees in orchards A-1 and A-2 have been, or are at present, in bloom with the exception of five or six varieties of apples. The orchards received a heavy irrigation on April 20, and this was followed by approximately one-half inch of rain about four days later. A calyx spray will probably be given during the week.

Recently several private water samples have been brought to the laboratory for analysis, particularly from the Stillwater district. Farmers of the locality and irrigation district officials have been discussing the use of drainage water for irrigation. Analyses indicate that the water is satisfactory for that purpose. It is planned to take a few soil samples at certain periods of the season to substantiate the results of the water analyses.

C. L. Moon.

Prosser

Farm operations in the valley were slowed up the first part of the week ending April 25 because of a very high wind, which continued for three days. Considerable damage was done to the asparagus which was ready to cut and to tips just starting from the ground. Some of the canals were blocked with weeds, causing them to overflow. The wind also damaged the wheat crop in the Rattlesnake and Horse Heaven country, telephone and light wires, and roofs of buildings.

The north side of the apple orchard has been leveled for the new metal flume. The concrete meter box at headgate No. 1 is under construction.

Eighteen hogs were sold, bringing 7¼ cents a pound at the station. Potato buying the past week has been light, twelve cars being shipped to western Washington and one car to California. The eastern movement of potatoes declined, only five cars being shipped. No. 1 Russets are selling at $1.00 to $1.10 per hundred. Extra Fancy Winesap apples have been selling for $1.60 per box.

Because of the warm weather during the week ending May 2 snow melted very rapidly in the mountains, causing the Yakima River to reach the high water stage abruptly. If the run-off had come more slowly,

Prosser (cont'd)

it could have been used a longer period for irrigation by valley farmers to relieve the water shortage.

The metal flume has been laid on the north side of the orchard, and part of the orchard has been irrigated. Corn seeding has been progressing rapidly.

Asparagus prices have fallen from $1.25 to 70 cents per crate. Some of the shippers are doubtful whether conditions will improve. The slump has caused some of the large concerns to discontinue packing. Producers are receiving 4½ to 6½ cents a pound for No. 1 asparagus. There was no change in the price of hay, which is still selling for $9.00 to $10 per ton; but potatoes, combination grade, have dropped from $15 to $11 per ton. The price of standard white eggs, including cases, has dropped from 21 cents to 17 cents; but the price of butterfat remains unchanged.

The weather data for April: Mean maximum temperature 67.7°, mean minimum 38.7, mean 53.2; total precipitation .435 inch; monthly evaporation 4.54 inches; mean hourly wind velocity 4.23 miles.

The highest temperatures in April occurred from the 27th to the 30th, ranging from 82° to 86°.

Carl A. Larson

Scotts Bluff

The average maximum temperature for the week ending April 25 was 46°, with a maximum of 67 on the 20th; the average minimum was 23, with a minimum of 14 on the night of the 23d. The average wind movement was 10.8 miles per hour. The precipitation amounted to .29 inch from about 4 inches of snow. The evaporation tank was drifted full of snow during the latter half of the week.

The week was very unfavorable for all kinds of work. It came in with two days of high winds followed by snow. The week has also been cold, with an average temperature of 23° as compared with 40° for the corresponding week last year. The precipitation for the month has been .33 inch as compared with 1.50 inches last year. As a result of the dry winter and spring, vegetation is very slow in starting. Alfalfa has made practically no growth, and some of last year's seeding has not survived the winter.

It has been necessary to reseed the alfalfa in field H. The old alfalfa is very slow in starting. The snow has put good moisture conditions in the soil, which is in good shape for planting. The beets that have been planted should make a good germination.

About 65 cars of lambs were shipped out of the valley during the week. The price is gradually working up, but the profit from the feeding operations will not be large for any feeder, and many feeders will just about break even.

Prices of other farm products are falling off. Sour cream is down to 16 cents and eggs are back at 10 cents. The price of potatoes has also declined, and there is little demand for them.

The average maximum temperature for the week ending May 2 was 64°, with a maximum of 69 on the 29th; the average minimum was 42, with a minimum of 36 on the nights of April 26 and 27. The precipitation amounted to .41 inch. The total evaporation was only .656 inch, or a daily average of .094 inch. The average hourly wind move-

Scotts Bluff (cont'd)

ment was 6.9 miles.

The first part of the week was favorable for all kinds of work. On Monday and Tuesday all the sheep, including the 13 lots of experimental lambs, were sheared. The lambs averaged 5.3 pounds per fleece. The shorn lambs average about 75 pounds in weight and will be continued on feed a few weeks longer. The price of lambs is still advancing.

During the week the grain and beet plots in field K were prepared and seeded. Grain plots in field E were also seeded. Owing to adverse weather conditions this seeding was a week or ten days later than last year. With the good moisture condition of the soil, however, growth should be rapid from now on. Early planted grain is up and is looking well. In the dry land wheat area, the grain is in fine condition. There will be practically no reduction of the acreage of winter wheat in this section.

Prices for produce and dairy products remain at the same low level. Young chickens are beginning to come on the market, but there is no demand for them and 12 to 15 cents is the highest price that is offered.

James A. Holden

Yuma

The maximum temperature for the week ending April 25 was 101°, minimum 49, and greatest daily range 47. No precipitation was recorded.

Weather conditions have continued to be ideal for the newly planted cotton and for the harvesting of the second cutting of alfalfa hay on the project. The continued drought in California has stiffened hay prices to some extent. Project growers are now getting about $12 per ton baled and on board cars. Lettuce shipments for the winter season have been completed. The prices received for this crop were only fair on account of the large acreage grown not only on this project but also in other irrigated sections of the Southwest. Shipments of cantaloupes will probably begin about the last of May.

The eradication of the running mesquite on the E and F series was continued during the week. Most of the larger trees of other varieties have been pulled out, and the shrubby growth of the obnoxious mesquite is being grubbed off. On the area around F-1 and E 7-8 the land has been grubbed and plowed with an 18-inch plow.

The second cutting of hay on the B and D series was harvested. Cotton lands were given another cultivation, and the two volunteer plots on the B series were hoed. The lower portion of the ditch on the D series was plowed and shoveled.

On April 22 two lots of pigs were placed on alfalfa pasture in the rotations. Each lot of four pigs weighed 299 pounds.

The maximum temperature for the week ending May 2 was 97, minimum 52, greatest daily range 45, precipitation .5 inch. The mean temperature for the month of April was 70.5. The Weather Bureau station at Yuma reports a mean temperature for the month of 73.6, which is 4.1 above normal. This was the warmest April since 1888. The year 1931 has averaged so far 2.1° above normal.

Yuma (cont'd)

The Yuma weather station further reports that the rainfall for April was .75 inch. This is the second wettest April in 61 years. The normal precipitation for the month is .1 inch.

The discharge of the Colorado River at Yuma for April was 408,400 acre-feet. This is the lowest record for that month, the 29-year average being 1,311,000 acre-feet.

The cool rains on April 26 and 27 afforded some relief from the high temperatures of the previous week. This rain was part of a general storm that covered most of the Southwest.

Station work performed during the week included the cutting of alfalfa hay on the irrigated rotations, thinning cotton plots, grubbing mesquite, cleaning and repairing ditches.

E. G. Noble

W E E K L Y R E P O R T S

Of The Division Of

WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

Vol. XXXIII May 9 and 16, 1931 No. 9

Huntley

Continued dry and unfavorable weather conditions prevailed during the two-week period ending May 9. There were several days of high winds and minimum temperatures below freezing. The maximum temperature was 79, minimum 27, and precipitation .05 inch. Irrigated crops have made but little growth, and it is reported that dry-land winter grains over the State have suffered serious injury from winds, drouth, and cut worms.

Water for irrigation was available on May 6. The general demand for water has made it necessary to place delivery on a rotation basis. The water in the river is so low that it is impossible to fill the canal to capacity.

Station work during this period included repairing and cleaning irrigation ditches and preparing land for seeding to corn and beans. Irrigation of pastures and rotation fields was started on May 7.

Mr Lewis A. Hurst, of the Bureau of Chemistry and Soils, was at the station on May 4 for the purpose of supervising the seeding of beets in the "Triangle" fertilizer experiment.

Dan Hansen.

Newlands

The average maximum temperature for the two-week period ending May 9 was 74, with a mean maximum of 85 on May 6; the average minimum was 43, with a mean minimum of 31 on the night of May 8. The mean temperature was 58.5. The average hourly wind movement was 5.1 miles. The precipitation for the period was .09 of an inch.

During this period there has been one general irrigation, and plantings were made in the areas requiring alfalfa seeding. B-18 to 22, inclusive, were seeded to alfalfa: one plot to the Baltic variety, one to Cossack, one to Hairy Peruvian, one to Grimm, and one to Common. Plots E-5 and F-5 were also seeded to alfalfa. Plots D-3 and 6 were seeded to barley.

It is rather doubtful if much alfalfa should be seeded this year because of the acute water shortage that threatens the farmers of this project. After due consideration it was decided to seed the rotations and the B plots as planned. Some water has been promised for newly-seeded areas, and some worth while data may be obtained as to just how little water may be applied to new alfalfa for the young plants to survive. There will be a shortage of water at the end of the season, but the young plants may obtain enough root system by that time to enable them to survive until winter storms set in.

Newlands (cont'd)

The area on Y that is to be seeded to corn, which will probably be planted during the week of May 10, has been manured and made ready.

The painting of the dairy buildings has been completed. The newly painted surfaces greatly improve the appearance of the station.

At present the State is constructing more concrete walks and paving some of the hog pens so that the floor will be in better condition for winter feeding experiments.

On May 4 and 5 the apple and pear trees in both orchards and on the sand hill received a calyx spray, which was applied at the rate of 5 pounds of lead arsenate to 100 gallons of water. All other fruit trees, including the plums, cherries, and peaches, were sprayed with nicotine sulphate, applied at the rate of one-half pound to 75 gallons of water.

The routine analyses of waters from the station area and from the project have been continued in the laboratory. The Truckee-Carson irrigation district has submitted several samples of drainage water for analysis to determine its suitability for irrigation purposes. A few soil deficiency determinations on untreated soils of the H series are now being made, and it is hoped that the new method being used will be helpful in determining the content of PO_4, K_2O, and Ca in the soils of the station.

E. W. Knight

Prosser

During the week ending May 9 250 feet of asphalt-coated pipe was laid on the north side of the pasture plots in order to create enough pressure to sprinkle the lawn.

The irrigation plots in the apple orchard have been irrigated, using a meter to measure the water on each plot.

Trading in hay futures in the Yakima Valley has begun in a small way. Contracts are being signed on the basis of $9.00 a ton for No. 1 first cutting, and $8.00 a ton for No. 1 second cutting. This is $3.00 less than the price of hay last year at this time. Hay is cleaning up normally and only a moderate amount of old hay is on hand. It is selling for $9.00 and $10 a ton.

Owing to the local consumption of wheat in the valley, the price has been boosted to 60 cents a bushel, which is a 5-cent increase. A few contracts for wheat deliveries in July and August have been signed on the basis of 43 cents a bushel.

Cheap potatoes are the kind wanted for shipment at the present time. The commercial grade and the No. 2 grade are making up the shipments.

The alkali plots at Mabton were irrigated the first of the week ending May 16. Owing to lack of time and equipment, the alkali work on these plots will be discontinued.

Yakima potatoes are still moving to the Middle West, but the westward movement has declined. Combination grade potatoes are selling for 90 cents to $1.00 a hundred pounds. Asparagus shipments from the Sunnyside district reached their peak about a week ago and are now on the decline. The daily volume during the last several days totalled about 30,000 pounds. The price ranges from 5 to 7 cents a pound; the low price last year was 7 cents.

Prosser (cont'd)

The mean maximum temperature for the first half of May was 81.1° and the mean minimum was 45.8°. The maximum temperature of 95.5° occurred May 13 and the minimum of 31.5° was on May 7. The greatest daily range was 47°.

Dr. C. S. Scofield and Mr. H. K. Dean visited the station on May 13 and 14.

Carl A. Larson

San Antonio

The three-week period ending May 2 was characterized by cloudy, humid weather and frequent small showers. Although precipitation was recorded for ten separate days, only two showers of appreciable size occurred. The total precipitation for the period amounted to 2.37 inches.

Temperatures throughout April remained subnormal. Although the mean for the month was 5.3 below the 23-year average, no extremely low minimums were experienced. Cotton required from 10 to 13 days to germinate and emerge and has made unusually slow growth. Excellent stands were secured from all plantings, however. Corn has made slower than normal growth but appears to be in excellent condition. The cool weather is believed to have been especially favorable for the small grains, for, notwithstanding the rank growth and high relative humidity, the infestation of leaf rust is exceptionally light and stem rust is almost non-existent except on some of the highly susceptible wheat varieties.

For the month of April the precipitation, all of which fell after the 17th, was .94 inch below normal.

Summary of the meteorological observations recorded for the three-week period and for April

Week ending	Temperature						Precipitation	Aspect of the sky		
	Maximum		Minimum			G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean	Mean					
							Inches	Days	Days	Days
Apr. 18	80	76.7	51	55.1	65.9	29	1.00	1	3	3
" 25	85	73.0	39	52.3	62.6	34	.66	0	5	2
May 2	83	74.1	54	60.1	67.1	21	.71	1	1	5
Month of April	88	74.7	37	52.3	63.5	36	2.25	7	10	13

Temperatures during the week ending May 9 continued subnormal. Cotton has made practically no growth, and bacterial leaf blight has appeared in some locations to a seriously damaging extent. Apparently conditions have been ideal for a heavy infestation of plant lice, but they have not been found on the station plantings in serious numbers. The maximum temperature for the week (as well as for the season to date) was 88°, minimum 50, mean 69.9.

Two days were clear and five were partly cloudy. The total rainfall was only .09 inch, although a measurable precipitation was recorded on three separate days.

San Antonio (cont'd)

Four laborers were kept busy throughout most of the week weeding rotation plots and miscellaneous fields. Oats for hay in the rotations and half of the alfalfa in field ABC-7 were mowed. All row crops were cultivated.

Geo. T. Ratliffe

Scotts Bluff

The average maximum temperature for the week ending May 9 was 59°, with a maximum of 82 on the 7th; the average minimum was 33, with a minimum of 28 on the morning of the 9th. The precipitation was 1.42 inches, making a total of 2.16 inches for the growing season. The total evaporation was .849 inch. The average hourly wind movement was 11.7 miles.

The week has been unfavorable for farm operations. The first three days were rainy with some snow; the last three days a heavy wind blew continuously. In the sandier portions of the project some of the early planted grain and beets was damaged. All farmers were notified by telephone that heavy winds were expected and that beets should be harrowed. In all probability this prevented much crop damage.

The beet contracts for the valley will total approximately 56,000 acres as compared with about 65,000 last year. Notwithstanding the low contract price for beets this year, the acreage applied for was about as usual, some of it being denied by the Sugar Company.

During the week the corn plots in field K were plowed and harrowed and the beet plots in field E were planted. The second planting in the time-of-planting test for sugar beets was omitted because of unfavorable weather. Beets were planted in the fertilizing test plot in the border east of field K.

The precipitation for the season since April 1 is less than half the precipitation for the corresponding period last year. For some time water has been in the main canal of the Pathfinder irrigation district as a result of filling the reservoirs, but water has not been turned into the laterals except in one or two places. The Farmers Canal has not yet turned water in from the river. Some of the smaller laterals have turned in small heads.

The average maximum temperature for the week ending May 16 was 74°, with a maximum of 88 on the 14th and 15th; the average minimum was 42, with a minimum of 35 on the mornings of the 10th and 11th. No precipitation occurred during the week. The total evaporation was 1.314 inches. The average hourly wind movement was 8.6 miles.

As the week has been warm and there has also been a fair amount of moisture, the growth of most crops has been good. The high winds of the past week dissipated the top moisture, so that the beets which have been planted during the last ten days will not come up until it rains or they are irrigated. The early planted beets have come up well.

Quite an acreage of early potatoes was planted during the week. Practically all of the beets have been planted, and the planting of corn has started. The acreage in corn will probably be larger this year than last.

Scotts Bluff (cont'd)

At the station most of the corn land has been plowed and harrowed. Considerable fencing has been done on the Walker tract, where the hog pastures will be located this summer. The sweet clover plots in fields K and E have been fenced, and ewes and lambs will be placed in these pastures. The dairy cows were turned on sweet clover pasture in field C on the 15th, and the steers have been taken to the Government pasture for the summer.

The grain plots in the new rotations in field E-11 and 49 were seeded during the week. The three rotations that have been added are: 12 beans continuous; 11 oats, sweet clover (green manure), beans; 49 oats, sweet clover (green manure), potatoes, beets, beans.

Mr. C. A. Taylor, of the Division of Agricultural Engineering, Bureau of Public Roads, visited the project during the week to make some preliminary studies in soil moisture investigations.

James A. Holden.

Yuma

The maximum temperature for the two-week period ending May 16 was 103, minimum 51, greatest daily range 48. No precipitation was recorded. Every day in the month was clear and very little wind movement was recorded.

The run of the Colorado River so far for the month of May indicates a new low record for that month. The present gauge readings at Yuma and at other stations on the upper river indicate that the flow of the river will be only one-half of the previous low record.

Station work during the month has included the thinning and cultivating of cotton, harvesting the second cutting of alfalfa, cutting the barley and wheat plots on the rotations, cutting the new plantings of alfalfa on Series A, C, and D, repairing irrigation structures, and cleaning ditches.

E. G. Noble.

W E E K L Y R E P O R T S

Of The Division Of

WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

Vol. XXXIII May 23 and 30, 1931 No. 10

Belle Fourche

The maximum temperature for the week ending May 16 was 91 and the minimum 34. No precipitation was recorded.

On the station during the week corn was planted, the pasture plots in field A were fenced, and the sweet clover pasture in G and the alfalfa in W were irrigated. The sheep were put on the various pasture experiments and the hogs on alfalfa pastures in field A.

The maximum temperature for the week ending May 23 was 78 and the minimum 21. There was a trace of precipitation as a result of snow. The severe frost on the 20th, when the temperature went to 21, did considerable damage to alfalfa, plums, apples, shrubs, and trees. The spring has been extremely severe on all trees and shrubs, particularly on the golden willows and Chinese elms. Most of the damage was done in March when an unusually warm spell was followed by very cold weather, the temperature going down to 8° below zero the last week in March.

During the week the sheep sheds were cleaned out, the apple orchard was irrigated, and some fencing was done.

Dr. Buckley, of the Bureau of Animal Industry, visited the station on Saturday and vaccinated the spring pigs.

The maximum temperature for the week ending May 30 was 95° and the minimum 38°. The precipitation was .90 inch. The total precipitation for May, 1.78 inches, is 1.07 inches below normal. The maximum of 95° on May 25 is the highest ever recorded during May at this station. The minimum temperature of 21° on May 20 is also the lowest temperature on record for May.

The sheep were sheared on May 25. The average for the entire flock was 9.14 pounds per sheep. Some wool has been sold locally at 15 cents a pound; last week the price was reduced to 13 cents a pound, but no sales have been made at that figure.

Two hundred pound fat hogs are selling locally at $4.25 a hundredweight, butterfat at 18 cents a pound, and eggs at 10 cents a dozen.

Potatoes were planted in field A, and the maximum production experiment was planted on Friday.

Beyer Aune

Huntley

During the three-week period ending May 30 the maximum temperature recorded was 93 and the minimum 21. The precipitation was .12 inch. Weather conditions continued unfavorable during this period.

Huntley (cont'd)

The total rainfall during the month amounted to only .17 inch as compared to a normal of 2.13 inches. The rainfall during the five months January to May, inclusive, was 2.23 inches; the normal for this period is 5.42 inches.

Frost on May 19, when the temperature recorded was 21°, destroyed garden crops and fruit.

The drouth is rather serious in most sections of the State. The supply of water for irrigation is low in many sections, and the situation will probably become acute before the season is over. Range conditions are also rather serious as feed is already short and the water supply for stock is low.

At the station the seeding of late crops, including corn, beans, and potatoes, was completed. Extra men were employed to irrigate; the irrigating "up" of crops is not yet completed. Sugar beets will require a second irrigation before thinning.

Station visitors included Director F. B. Linfield, of the Montana Station; Dr. S. S. Buckley, of the Bureau of Animal Industry; and Mr. Colin A. Taylor, of the Bureau of Agricultural Engineering.

Dan Hansen.

Newlands

The average maximum temperature for the two-week period ending May 23 was 79, with a mean maximum of 87 on the 12th; the average minimum was 41, with a mean minimum of 31 on the 19th. The mean temperature was 60. The average hourly wind movement was 5.8 miles. There was .01 of an inch of precipitation during this period.

The outlook for sufficient irrigation water for the project during this year is not particularly bright. It has been necessary to curtail some of the plantings at the station that had been planned. According to present indications, there will be two more general irrigations at the Field Station. Ensilage corn will not be planted. The seeding of some planned pasture will be deferred until a more favorable time.

The district managers are doing all they can to obtain as much water as possible and to conserve to the fullest extent the supply they have. A large part of the drainage outflow is being pumped back into the irrigation canals on the lower end of the project. This constitutes a large portion of the irrigation water of the farmers on the eastern outskirts of the project. There is little hope, however, that there will be more than 50 per cent of the usual irrigation supply available for the local farmers.

The general agricultural depression is manifested on this project by the low prices being received for farm products. Butterfat is 23 and 24 cents a pound, and alfalfa hay is $8.00 a ton delivered at the alfalfa mill. These prices are better than those reported on some other projects, but as a whole there has been as great a decrease on this project as in other places.

The general work at the station has consisted of one general irrigation, a continuance of the tractor work, cultivation of the orchard, and some repairs to buildings.

Newlands (cont'd)

Mr. F. B. Headley, who recently visited this station, has made arrangements to purchase from a local farmer 150 tons of this year's first crop hay, which is to be used in the dairy-feeding experiments during the next fiscal year. This is more hay than is generally purchased, but because of the water shortage the amount of hay the station can furnish for feed will be much less than in former years.

E. W. Knight.

Prosser

Report for week ending May 23

Most of the corn fields have been seeded. The early plantings of corn have attained a height of six to eight inches. The potato ground is being prepared for planting.

The Yakima River is still high, although the cool weather of the past week has reduced the amount of water. This will be an aid to the irrigated districts because the melting snow reserve will last longer, thereby supplying flood waters for a longer period of time.

Strawberry respiration work on berries from fertilizer plots at Kennewick is being carried on at this time. The soil moisture work in orchard irrigation has been carried out on schedule. The plot receiving an 18-hour irrigation every fifteen days had a high percentage of moisture in the sixth foot just before the following irrigation was applied. This is more or less of a detriment to the sampling work because the excessively moist soil will not come out of the soil tube.

The size of the orifice in the new concrete meter box at the head of the orchard was reduced in order to obtain a more accurate measurement of the water.

To obtain information regarding evaporation of water thrown by sprinklers, Mr. Harry Garver, investigator in Agricultural Engineering, has been running some sprinkler tests on a concrete basin which is equipped with a water-measuring device for the run-off. These tests will be made from time to time throughout the summer.

Messrs. Reeves and Yother, of the Federal Plant Physiology and Pathology offices in Wenatchee, visited the station. Drs. Hafenrichter and Overholser and Mr. Schafer, from the State College of Washington at Pullman, also visited the station.

Report for week ending May 30

Ground is rapidly being prepared for the planting of potatoes. Fertilizer was applied to potato plots at Harrah and Sunnyside. These plots are carried on in cooperation with farmers of the valley. Indicator crops for various fertilizers have been planted at the station. Alfalfa is beginning to bloom, and the hay harvest will be under way in about a week.

Because of the water shortage in the valley the amount will be reduced one quarter of the normal deliveries, according to Mr. Moore, Superintendent of the project. At the present time there is still flood water in the Yakima River, which is encouraging to the valley farmers.

The supply of strawberries from the Kennewick district has dwindled, and berries are being shipped into Yakima from the Coast districts.

Prosser (cont'd)

The maximum temperature for the past two weeks was 94.5° and the minimum 36.5. The greatest daily range was 45.5. Rain amounting to .01 inch was recorded on May 22.

Carl A. Larson

Scotts Bluff

The average maximum temperature for the week ending May 23 was 67°, with a maximum of 91 on the 23d; the average minimum was 34, with a minimum of 20 on the night of the 19th. The average hourly wind movement for the week was 10.4 miles. The total evaporation was 1.639 inches. No precipitation occurred during the week.

The weather during this week has been erratic, as is often the case in this month. Ice formed on stock tanks four nights in succession. The minimum temperature of 20° injured a good many gardens and froze some of the beets. The larger beets in the fields seemed to have suffered the greatest damage, but for the most part a fair stand will be left. The unfortunate part of it is that so much of the acreage is not up and will not emerge until it rains or the ground is irrigated. The Sugar Company has not yet determined what the percentage is, but in all probability more than half of the seed planted has not germinated. If there is no rain over the week-end, some of the growers intend to commence irrigating; but on much of the acreage, in the rolling and steeper sections, irrigation is not practicable as washing and drifting soil would destroy the stand. It is rather a serious condition for the beet growers. On the early planting where the beets had a good start and are down to moisture they are being thinned. These beets are looking well and there is a fair stand.

At the station the principal work has been cleaning the corrals on the Walker tract and fertilizing some potato test plots to be used by Mr. Werner of the College of Agriculture at Lincoln. The sorting of potatoes has begun, and the fencing of hog pastures was finished. The potato plots in fields K and E were plowed and harrowed. The planting of corn plots was finished. The alfalfa in field H was irrigated, and water was turned on the sweet clover pasture in field C.

The potato market seems to be badly demoralized, and there is little demand for seed stock. Hogs are selling at extremely low levels, the top at Omaha today being $6.30, which means about $5.50 in the valley Lambs made a small gain during the week, but the top price for fed lambs was only $8.75. As to cattle, the top price for choice yearlings was $8.75.

The average maximum temperature for the week ending May 30 was 77°, with a maximum of 95 on the 25th; the average minimum was 46, with a minimum of 34 on the morning of the 30th. The precipitation for the week was .07 inch, making a total of 2.22 inches for the growing season and a total for the year to this time of 3 inches. The average hourly wind movement was 6.8 miles.

While the mean temperature for the month of May was a little above that for last year and the normal for the past 20 years, it has been distinctly unfavorable for crop growth. There was a very limited

Scotts Bluff (cont'd)

amount of rain in April—about one-sixth of the normal—but the precipitation the first ten days of May was above normal. The last 20 days, however, were the dryest that have been recorded. Grain is not suffering yet, but the alfalfa and sweet clover seeding is beginning to wilt. Beets planted since it turned dry have not come up, and unless rain comes soon they will have to be irrigated up where that is possible. Early beets are doing nicely and blocking will start probably during the coming week.

At the station the beet plots in fields K and E were cultivated, and the potato plots in these two fields were plowed with the exception of rotation 17 in field E. It was left so that the sweet clover could make more growth before being plowed under. The sorting of potatoes has been continued. Water was run continuously on the main station farm and was turned on the sweet clover pasture on the Walker tract during the week.

A heavy wind on the 26th was quite destructive in some sections, especially in the lighter soil area north of Minatare and Bayard. Several hundred acres of beets were blown out and considerable damage done to windmills and out buildings.

Twelve hogs in the 250-275 pound class were taken to an auction sale and netted $4.90 per hundred, which is a little better than we would have received had we shipped to market. Cattle and hogs both have declined in price, but lambs are still making slow gains. Eggs and cream have made small advances.

James A. Holden

San Antonio

Temperatures were somewhat higher during the three weeks ending May 30 than during the preceding period, but optimum cotton weather had not yet occurred. All leaves of a large percentage of the crop on the station are dwarfed and misshapen. The mean temperature for the month of May, 72.4°, is 3.5° below normal. No rainfall occurred during the first week of the period. Scattered showers produced totals of .96 and .65 inch for the second and third weeks, respectively. Precipitation for the month of May was 1.31 inches below normal.

The meteorological data for the three weeks and for the month of May are summarized below:

Week ending	Temperatures						Precipitation	Aspect of the sky		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean						
							Inches	Days	Days	Days
May 16	91	84.9	47	56.0	70.4	33	--	5	1	1
" 23	88	83.0	59	63.9	73.4	29	.96	0	3	4
" 30	90	86.0	62	66.7	76.4	25	.65	0	3	4
Month of May	91	84.0	47	60.7	72.4	36	1.82	10	11	10

San Antonio (cont'd)

Conditions were ideal for the maturing of flaxseed and small grains. Barley varieties matured from May 13 to 21, oats from May 16 to 25, and wheat varieties from May 12 to 28. All the flax varieties were uniformly ripe for harvest about May 25. All normal plantings of these crops on the station were harvested by the 28th under very favorable conditions, and normal yields of good quality are anticipated.

Cotton thinning was started May 28. Weed and grass growth has been luxuriant this spring, abundantly so on all manured fields, and cotton thinning is correspondingly tedious and slow.

In addition to harvesting and cotton thinning, station labor has been employed at miscellaneous weeding, harvesting and baling alfalfa and oats hay, cultivating orchards and all row crops, and upkeep of grounds and nurseries.

Station visitors were as follows: May 10, Paul R. Dawson, Associate Biochemist, and J. H. Hunter, Assistant Soil Technologist, of the Bureau of Chemistry and Soils; May 20 to 25, A. C. Dillman, Associate Agronomist in Charge of Flax Investigations, Division of Cereal Crops & Diseases; May 28 and 29, D. R. Hooton, Assistant Pomologist, Division of Cotton, Rubber, and Other Tropical Plants.

Geo. T. Ratliffe.

Yuma

The maximum temperature for the week ending May 23 was 101°, minimum 46, and greatest daily range 49. No precipitation was recorded. On two days early in the week there were high winds from the east and lower mean temperatures. Although these winds were quite strong at times, practically no damage was reported to field and tree crops.

Cotton thinning on the rotations was completed during the week, and most plots were given their first irrigation. The two ratooned Pima plots on the B series were watered for the second time. These two plots are now flowering quite freely.

Station work performed during the week included the harvesting of the first cutting of alfalfa on the A series, plots A-1 to 8, inclusive; cultivating citrus and date orchards, grubbing mesquite, cultivating cotton, cleaning and repairing ditches.

Threshing of the wheat and barley plots was completed during the week. The two rotations which include wheat yielded 2.9 bushels in No. 13 and 22 bushels in No. 42. The yields of barley are given in the following table.

Yuma (cont'd)

Barley Yields of Irrigated Rotations, 1931

Rotation No.	Plat No.	Per cent stand	Per cent grain to straw	Height at maturity, inches	Bushels per acre
8	C-II- 2	95	64.2	30	10.8
9	I- 2	100	64.5	31	8.3
11	- 1	100	63.0	34	21.3
12	D-II- 6	100	233.3	18	4.1
24	C-II- 9	100	83.7	16	3.4
26	-26	90	58.7	24	11.3
28	-23	85	23.5	27 1/	8.0
30	- 5	95	40.4	18 2/	7.9
31-1	I-26	95	81.6	27	12.2
31-2	-27	95	61.8	30	10.2
32	-25	100	66.2	36	36.2
42	-16	80	68.7	30	11.5
46	II-15	60	52.2	39	28.6
50	D-II- 5	70	51.4	34	21.2
54	C-II-19	90	51.8	27	9.3
56	I-19	95	57.2	32	13.3
60	D-II-12	60	63.3	34	28.8
63	I-15	100	95.7	33	12.8
65	II-20	98	80.6	25	12.8
Maximum		100	233.3	39	36.2
Minimum		60	23.5	16	3.4
Average		90	71.7	29	14.4

1/ 30 per cent sweet clover. 2/ 15 per cent sweet clover.

The maximum temperature for the week ending May 30 was 108, minimum 51, greatest daily range 55. The mean ~~maximum~~ temperature for the month of May was 97 and the mean minimum 55. The mean temperature of 76 is 5.7° warmer than May 1930. No precipitation was recorded.

The Weather Bureau station in Yuma reports a mean temperature of 80.8°, which is 4.6° above normal, making it the warmest May since 1886.

The discharge of the Colorado River at Yuma for May was 853,700 acre-feet. This is a low record for May, being only about one-half the former low record set for 1908. The 29-year average for May is 2,586,000 acre-feet.

Normal temperatures were recorded during the month with the exception of the last four days. The high maximum and minimum temperatures with drying winds for this short period were rather severe on growing crops.

Station work during the week included the harvesting of the third cutting of alfalfa hay on plots 31 to 37 of the D series, cultivating and hoeing cotton, cleaning irrigation ditches, and repairing station buildings.

E. G. Noble

W E E K L Y R E P O R T S

Of The Division Of

WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

Vol. XXXIII June 6 and 13, 1931 No. 11

Belle Fourche

For the week ending June 6 the maximum temperature was 86 and the minimum 50. The precipitation was .42 inch.

This spring the Leonard Seed Company contracted about 200 acres of beans. The following varieties of seed were furnished by this company and planted in field G on June 1: Black Valentine, Currier's Rust Proof, Giant Stringless Green Pod, Tennessee Green Pod, Early Improved Red Valentine, Improved Golden Wax, Bountiful, Stringless Refugee, and Burpee's Stringless Green Pod.

The beets in rotations following potatoes, sweet clover, or alfalfa were practically all killed by the frost on May 20 when the temperature went down to 21. In these rotations the beets were replanted on June 1, and where they follow sweet clover or alfalfa they were irrigated immediately after planting. All of the alfalfa and grain in field A was irrigated during the week.

Other field activities during the week were as follows: Making ditches in fields I, K, and Y; cleaning alleys and roads in fields A, B, P, and O; and cultivating corn in A, B, C, F, and P.

The maximum temperature for the week ending June 13 was 93 and the minimum 43. The precipitation was .91 inch. This rain was a great help to the sugar beets, corn, and small grain, but it was not general over the entire project. The replanted beets were up with a good stand at the end of the week. Due to the cold, dry spring, a good many of the early planted beets were heavily infested with black root. Since the rains and warm weather there has been a material improvement, although the beets may never fully recover.

During the first half of the week the alfalfa, grain, and sugar beets were irrigated in M-P, O, P, and W. All the beets were cultivated for the first time, and thinning was commenced on the plots that are growing best.

There has been no improvement in the prices of farm produce since the last report. A pool of wool was formed by Clay-Robinson banks in the valley, and most of the wool in this locality was sold at 15 cents a pound. Some wool will be consigned to the National Wool pool.

Beyer Aune

Huntley

A rainfall of .33 inch during the week ending June 6 was the highest recorded in several weeks past; and while this was not sufficient to be of much benefit to crops not yet irrigated, it helped to

Huntley (cont'd)

prevent crusting of the surface on soils recently irrigated. The maximum temperature recorded during the week was 87 and the minimum 42.

The first irrigation of all crops was completed during the week, and beets are being irrigated a second time before thinning. Fairly good stands are in prospect on all of the plots, although black rot is prevalent on several of the plots in the two-year unmanured rotations as well as in the 4-year rotations not manured. In rotation 46, in which beets follow alfalfa, this condition is particularly serious.

Several hundred acres in beets will probably be abandoned on the project due to failure to obtain satisfactory stands. While there is some loss of acreage each year, the amount this season will probably be larger than usual because of drouth and unfavorable weather. This land is being seeded to beans or late grain crops.

Range and dry-land conditions continue to be serious over most sections of the State, and there is already a severe shortage of feed and water for livestock.

Dan Hansen

Newlands

The average maximum temperature for the two-week period ending June 6 was 81.7, with a mean maximum of 90 on May 30 and 31; the average minimum was 48.5, with a mean minimum of 38 on the night of May 27. The mean temperature was 65.1. The average hourly wind movement was 3.4 miles. The precipitation for the period was .58 inch.

The project seems to be beset with troubles this year. There is still an acute water shortage. Several crop pests have arrived to plague the farmers. Alfalfa weevil seems to be more severe than usual, many farmers reporting a heavy loss on their first crop. Some dusting has been done, but for the most part the area infested has remained untreated and has resulted in a heavy loss. The alfalfa at the station was more severely infested than in any year since the first appearance of the weevil. It has been reported that the grasshoppers have been doing quite a little damage also. Numerous farmers have requested the formula for poisoned mashes.

There has been one general irrigation at the station, and a small area has been plowed and leveled. Perhaps but one other irrigation will be available for the farm; if so, it is not probable that a second crop of hay will be cut. Such an irrigation should result in a fair amount of alfalfa for fall pasture.

On June 2 Dr. A. N. Khosla, Executive Engineer of the Punjab Irrigation Project in India, visited the station. He spent the greater portion of the day investigating the irrigation and alkali problems of this project. As a result of rising water tables an alkali problem has been developing on the project from which he came. He says that some areas appear to be in very bad shape. The purpose of Dr. Khosla's trip to this country is to get information that would aid in the reclamation of these areas. He is visiting reclamation areas in this country and interviewing men connected with this work. He expects to spend some time with Dr. Kelley at Riverside, California, and with Mr. Scofield in Washington, D. C.

Newlands (cont'd)

Mr. C. L. Moon, of this station, was transferred for a temporary period to the Limoneira Laboratory at Santa Paula, California, to learn the technique and operation of a new method of boron determination on waters and soils. This new method, Cavanaugh's Electrometric Determination of Boron, will probably be adopted at this station in the near future, replacing the distillation method now in use. One advantage of the Cavanaugh method is that a determination may be made in 20 to 30 minutes with an aliquot of only 250 cc. necessary as compared with the 16 to 20-hour period and the 2500 cc. aliquot required for the distillation method. The results are consistently higher than those obtained by the distillation method, but it is felt that they are closer to the true amount of boron present in a water or soil than is the distillation method.

Additional data were also obtained on the Scofield Duplex Electrode for conductance determinations. The calculations were made so as to eliminate the temperature factor, making it possible to obtain the conductance of the unknown at any temperature, then calculate to 25° C.

E. W. Knight

Prosser

Report for week ending June 6

The reservoirs which supply the irrigation water for the Yakima Valley have been slowly and steadily filling until June. In 1926, when the last water shortage occurred, the reservoirs did not gain in storage during the spring as they are this year. There is still much uncertainty among the farmers as to how much water they will have for the season.

Alfalfa hay harvest will begin about the 10th of June. The potatoes will all be planted soon. Wheat is well out of the boot and is beginning to joint.

A comparison of the movement of new crops this year with last year: Asparagus, this year, 48 cars; last year, 84 cars. Strawberries, this year, 15 cars; last year, 11 cars.

A temperature of 100.5°, the highest of the season, occurred June 7.

The last of the potato plots were seeded during the week ending June 13. The plots include fertilizer, variety, and irrigation plots.

Hay cutting was begun June 11 and is going on now quite rapidly. This work was considerably retarded because of rainy weather over the week-end.

There has not yet been any decrease in the Station's water supply. The warm weather the first of the week increased the run-off from the mountains, making the release of storage water from Lake Keechelus unnecessary. On June 7 there were 505,217 acre-feet in storage and the following day 505,851 acre-feet. Owing to the lower temperature, storage water is now being used to supply the requirements of the Wapato and Sunnyside Canals. On June 13 the discharge in c.f.s. was as follows: Lake Keechelus, 750; Lake Cle Elum, 1010; Tieton reservoir, 853; storage on hand, 497,774 acre-feet.

Conductivity of Sunnyside Canal water June 11, 1931: $K \times 10^5 = 11$.

Prosser (cont'd)

Potato shipments have continued extremely light. Shipments eastward have been resumed on a moderate scale. Prices of new hay have been steady this week at $9.00 a ton for No. 1 first cutting. Thirty-two cars were shipped from the valley this week.

Temperatures for the first half of June: Maximum 100.5°, minimum 41.5, greatest daily range 43. There was a total rainfall of .06 inch, which was received June 13.

Carl A. Larson

Scotts Bluff

The average maximum temperature for the week ending June 13 was 85°, with a maximum of 94 on the 8th; the average minimum was 51, with a minimum of 46 on the morning of the 11th. The precipitation was .08 inch, making a total of 2.67 inches, which is the lowest for this season of the year since 1910 with the exception of the year 1919, when for this same period the rainfall amounted to only 2.21 inches. The evaporation amounted to 1.529 inches. The average hourly wind movement was 6.7 miles.

The week has been hot and dry, and weather conditions have been ideal for all crops that have had sufficient moisture. Alfalfa and grain that have been irrigated have made rapid growth. All of the grain on the Walker tract has been irrigated during the week, and the seeding of alfalfa and sweet clover is in fine shape. The alfalfa and sweet clover pastures on this tract, where the hogs and the dry and young dairy stock run, are keeping well ahead of the needs, and the stock is in good shape.

On the station the alfalfa plots have been watered in field K. It finally became necessary to "irrigate up" the beets in some of the test plantings in the fertilizer plots east of field K and on the Walker tract. By careful handling of the water it was done with fair success and the beets are coming through. The beet plots in field K were thinned during the week and the stand is very good.

Three decks of lambs were shipped the latter part of the week and are going on an unfavorable market. Some 30 cars of cattle were shipped out at the end of the week. Cattle feeders are taking a heavy loss this year, while most of the lamb feeders will make a small profit.

General conditions over the valley are rather serious. According to the Great Western field men, about 20 to 30 per cent of the sugar beet acreage has already been abandoned and it is believed that unless rain comes soon to supplement the irrigation there will be a further loss. This acreage will probably be replaced, largely with beans and potatoes.

Prices of all kinds of livestock are still declining. Feed prices remain about stationary, the retail prices at the elevators being 95 cents per hundredweight for yellow corn, barley 65 cents, bran $1.15, shorts $1.25.

James A. Holden

Yuma

The maximum temperature for the week ending June 6 was 109°, minimum 57, and greatest daily range 47. No precipitation was recorded. The weather, as compared with the abnormally high temperatures during the latter part of May, has moderated during the past week. South and southwest winds blowing in from the Gulf of Lower California have caused the lower temperature. At the end of the week the maximum was only 81°.

Cotton on the project seems to be about two weeks ahead of normal. Spring-planted upland cotton is flowering quite freely although the plants are not much higher than normal. In some sections of the project the fields are not as free of weeds and grass as they might be. In most cases this is undoubtedly due to insufficient funds to take care of the crop properly.

The water rate for the Bard and Indian Reservation divisions of the project has been set at $3.00 per acre for the season. This is a reduction of 75 cents per acre from last year's price. The cost of water on the Yuma Valley division has not yet been fixed for the present season.

Station work during the week has included the harvesting of the third cutting of alfalfa hay on the rotations, plowing barley stubble plots, cultivating and hoeing cotton, and cleaning and repairing ditches.

The maximum temperature for the week ending June 13 was 102, minimum 55, and the greatest daily range 43. No precipitation was recorded. Cooler than normal temperatures were recorded early in the week.

The low prices quoted on alfalfa hay this spring will probably cause an increase in the acreage to be harvested for seed. On some of the earlier fields turned to seed the crop prospects are only fair. The fields that turned to seed two or three weeks later show indications of a normal seed yield.

Threshing will probably start on the project the latter part of June, as some of the fields are earlier than normal due to the better growing conditions and higher temperatures during the month of May.

Carload shipments of cantaloupes from the Yuma project were started during the past week, but prices were disappointing. There will be about 4,000 acres of cantaloupes to be harvested.

The Yuma project, especially that portion of it in Yuma County, is still very much concerned about the action of the Arizona State authorities in regard to the plant quarantine. The present indications are that five of the thirteen inspection stations will be maintained after July 1. These include the road stations at Yuma and Wickenburg on the west, two road stations on the eastern frontier of Arizona, and one at Gila Bend. The station at Gila Bend is to protect Yuma County from the spread of the pink bollworm of cotton.

Station work performed during the week included the irrigating of Pima cotton for the second time, cultivating and hoeing cotton, plowing barley and sweet clover stubble plots for grain sorghums, grubbing out mesquite and cottonwood trees, general hoeing and cultivating.

E. G. Noble

W E E K L Y R E P O R T S

Of The Division Of

WESTERN IRRIGATION AGRICULTURE

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Vol. XXXIII June 20 and 27, 1931 No. 12

Belle Fourche

During the week ending June 20 the maximum temperature was 103 and the minimum 49. There was no precipitation.

During the week the beets were cultivated and thinned, irrigation ditches were cleaned, and ditch banks were mowed. The barley in fields K and Y and the oats in field I were irrigated. Due to the extremely dry spring there was no stand of sweet clover on parts of fields I and Y. Before these fields were irrigated they were reseeded with sweet clover.

During the week ending June 27 the maximum temperature was 105 and the minimum 58. The precipitation was .04 inch.

The harvesting of the alfalfa was started on June 22 and was practically completed during the week. Due to the extremely hot weather the first cutting of alfalfa was about 25 per cent less than in normal years even when well irrigated. All the alfalfa, grain, sugar beets, corn, and potatoes were irrigated in field A during the week. The extremely hot weather has caused all grains to head very short, and the present indications are that the yields of grain will be considerably below normal.

Corn is in very good condition, particularly that under irrigation. Beets are also in fairly good condition; those that have been properly taken care of are farther along than normal for this time of the year, and so are the potatoes. The thinning of the beets on the project is about completed. Due to the unfavorable spring, about 10 per cent of the total beet acreage was abandoned and put into some other crop.

Mr. D. A. Spencer, of the Bureau of Animal Industry, visited the station on the 22d and 23d. He inspected that portion of the Forest Reserve in the Hills set aside for the grazing of sheep.

Beyer Aune.

Huntley

The weather continued dry during the two-week period ending June 20, with several days of unseasonably high temperatures. The maximum temperature recorded was 105, minimum 48, and a trace of precipitation.

Crop conditions generally over the project are rather unfavorable. The thinning of sugar beets is nearing completion, but many farmers are reporting rather poor and ununiform stands. The total acreage on the project will probably amount to about 5,500 acres, a reduction of more than 500 acres from the original area seeded to beets. Harvest of the first cutting of alfalfa is under way. The

Huntley (cont'd)

crop generally is rather light and many fields are weedy and have light stands.

All crops on the station have been given the second irrigation. Other station work included thinning of beets and cultivating row crops. Harvest of the first cutting of alfalfa was started during the latter part of the period. This crop is fairly good on most of the rotation plots and in the larger fields.

Dr. C. E. Leighty and Mr. J. M. Stephens, of the Division of Dry-Land Agriculture, and Director F. B. Linfield of the Montana Experiment Station visited the station on June 14.

The maximum temperature for the week ending June 27 was 99, minimum 45, and a trace of precipitation. Dry and hot weather continued during this period. Crops are making fair growth where sufficient moisture is available, although the general crop condition over the project is not very favorable at this time due to continued drouth.

Some damage has resulted to the beet crop due to a general invasion of sugar beet web worms.

The first cutting of alfalfa was harvested during the week. The yields from the irrigated rotation experiments averaged 1.83 tons per acre.

Other station activities included the irrigating and cultivating of row crops.

Dan Hansen.

Newlands

The average maximum temperature for the two-week period ending June 20 was 80.5, with a mean maximum of 90 on the 13th; the average minimum was 50.2, with a minimum of 35 on the night of the 17th. The mean temperature was 65.2. The average hourly wind movement was 3.5 miles. The precipitation was .23 of an inch for the period.

During this period the crops have been cultivated and irrigated. The supply of irrigation water becomes a source of greater concern as each week passes. From present indications there will be a depleted supply by August.

On most farms of the project the first crop of hay is now being harvested. The station alfalfa is now in the shock and stacking will commence this week.

The agricultural conditions of the project show little improvement. Prices being paid for farm products are the lowest in years. The dairy industry has been hit particularly hard with a price of only 24 cents a pound for butterfat. This situation has resulted in some drastic culling of dairy herds and a larger surplus of hay than usual. If the water situation does not improve, it is likely that there will be a demand for the surplus hay during the coming year. Those farmers producing hay for sale are expecting better prices than were paid last fall. The reduced yield, however, will probably offset the net to be gained through higher prices.

The dairy experiment being conducted cooperatively with the State at this station is rapidly rounding into shape. The sterility trouble seems to be about eliminated.

E. W. Knight

Prosser

During the week ending June 20 .35 of an inch of rain was received. The maximum temperature was 83.5 and the minimum was 45.

The last of the alfalfa hay was cut June 16, but because of intermittent showers no hay has been stacked. The quality of the first cutting of alfalfa throughout the valley will probably be adversely affected by the rainy weather.

Recent rains swelled the valley streams to a considerable extent. At the Sunnyside Dam the wastage increased from 120 c.f.s. to 432 c.f.s. in 24 hours. As a result of the rains, the release of water from Lake Kachees Reservoir was reduced from 681 to 426 c.f.s. On June 11 the total amount of storage water had increased to 501,191 acre-feet, and on June 20 it amounted to 504,456 acre-feet. This is a larger amount of water than was held at this time in 1926, a previous dry year, but this year the Kittitas District must be supplied, which is now taking 410 c.f.s.

Conductivity of Sunnyside Canal water on June 18: $K \times 10^5 = 7$.

The cherry crop was seriously damaged by recent rains. More damage occurred in the upper valley than in the lower valley. Potato shipments eastward have increased slightly. New potatoes are quoted at $1.75 per hundred.

A comparison of the shipments of new crops in carload lots this year and last year:

	1931	1930
Asparagus	48	84
Strawberries	15	11
Potatoes	12	7
Cherries	27	110

The maximum temperature for the week ending June 27 was 83°, the minimum 39.5, and the greatest daily range 40. Precipitation, .40 inch.

All of the first cutting of alfalfa hay on the station has been stacked. The cutting of hay still continues in the valley, but most of the first crop is in the stack.

On June 25 the flow of water in the Sunnyside Canal was cut 25 per cent because of the water shortage. Heavy rains, however, increased the flow above normal by the end of the week. The 25 per cent cut is expected to take effect very soon.

Cherry picking and packing are about finished except on the higher elevations from which small allotments will be received. Lamberts and Black Republicans will constitute the bulk of the receipts. Yellow Transparent apples are selling for $40 per ton. New potatoes in the Yakima Valley are being sold at $18 to $20 per ton at shipping point.

A comparison of the movement of crops in carload lots this year and last year for the week ending June 26:

	1930	1931
Apples, new	1	0
Apples, old	31	32
Cherries	138	66
Potatoes, old	16	54
Potatoes, new	39	37

Prosser (cont'd)

Seasonal totals to date:	1930	1931
Apples	1	0
Cherries	248	99
Potatoes	46	49
Strawberries	11	15
Asparagus	83	48

Visitors at the station this week were as follows: J. Allen Clark, Western Wheat Investigations; B. B. Bayles, Office of Cereal Crops and Diseases; E. F. Gaines, Professor of Genetics, State College of Washington; and H. L. Westover, Office of Forage Crops.

Carl A. Larson

San Antonio

The three weeks ending June 20 have been characterized by seasonably high temperatures and decidedly subnormal precipitation. Daily maximum temperatures have ranged in the upper nineties. Only two insignificant local showers have been received.

Cotton has improved immensely during the period and is not yet showing any signs of moisture shortage. Boll weevils were first observed during the second week of June. Corn has fired rapidly on neighboring farms during the last ten days, while most of the plots on the station show less distress and will produce a fair crop if no more rain is received. A rain within the next week, however, would greatly improve the quality of the grain. The difference in condition between the station corn and that of neighboring farmers is believed to be due, primarily, to the wider row-spacing used in station plantings. An excellent crop is ripening on the early grain sorghums and rain at this time would be of doubtful value to them. The sorghum midge has not been seen in the fields to this date, and it is now too late for it to be a factor in any but late planted fields or long season varieties.

Flax varieties, the two earliest plantings in the time-of-planting flax test, and all small grain plantings on the station were threshed during the period. All these crops were specially favored by the combination of excessive rainfall during February and March followed by subnormal mean temperatures through maturity. All grain filled exceptionally well, yields were record breaking, and the dry weather from time of harvest until after threshing permitted housing the highest yields and best quality of grain on record in this section. Although ample moisture was available throughout the spring, infection of both leaf and stem rusts was abnormally light and caused practically no reduction of yield except in the case of Dixie wheat. A summary of yields and test weights is given in tables which follow. The relatively light infestation of rusts despite the ample moisture is believed to have been due to the low mean temperature maintained during the critical periods of flowering and maturing.

In addition to harvesting and threshing operations, farm labor has been kept busy weeding, thinning, and cultivating cotton, and miscellaneous weeding of all fields - planted and fallow.

San Antonio (cont'd)

Small Grain Yields - Variety TEST - 1931

Variety	Yield per acre (bushels)				Weight, pounds per bushel
	First plot	Second plot	Third plot	Average	
Wheat					
Kubanka	32.8	33.5	37.8	---1/	---
	30.5	30.5	36.5	33.6	61
Ceres	21.5	24.0	21.8	22.4	60
Marquillo	32.3	33.8	30.6	32.2	59
Hope	29.8	29.5	28.5	29.3	59
Reliance	21.8	21.0	20.3	21.0	54
Mindum	33.0	33.0	37.3	34.4	60
Dixie	10.8	13.3	11.5	11.9	47
Oats					
Texas Red Rust-proof	94.2	90.0	100.0		
			92.8	94.2 2/	29.0
Ferguson 922...	100.3	92.8	91.0	94.7	26.0
Nortex	82.5	100.0	80.6	87.7	29.0
Brunker	65.6	79.7	85.3	76.9	30.5
Barley					
Texas Winter ..	65.0	74.4	74.4		
			59.7	68.4 2/	47
Vaughn	90.6	93.1	90.0	91.2	46
Hannchen	60.6	51.3	46.3	52.7	50
Trebi	54.4	58.8	50.6	54.6	34

1/ Average of six check plots.
2/ Average of four check plots.

Oat Yields in the Rotation and Tillage Experiments - 1931

Plot	Rank	Yield(bu.per acre)	Test Wt.(lbs.per bu.)
		Oats for Grain	
B5- 8	1	85.8	31.5
A4-17	2	81.9	31
A4-13	3	80.8	31
A4- 5	4	76.2	29
A5- 9	5	70.4	29
A5-13	6	42.8	25
A5-17	7	41.4	24
A6-16	8	37.1	25
		(tons per acre)	
		Oats for Hay	
A6- 8	1	3.84	
A5- 3	2	3.55	
B5- 7	3	3.43	
A6- 5	4	3.41	
A5- 6	5	3.06	
A6-12	6	2.92	
A6-10	7	2.90	
B4-17	8	2.77	

San Antonio (cont'd)

Flaxseed Yields - 1931

	Yield per acre (bushels)				Weight per bushel
	First plot	Second plot	Third plot	Average	
					Lbs.
Variety Test					
North Dakota	18.4	20.1	19.8		
Resistant 114	17.6	19.6	20.1	19.3 1/	56.0
Linota	15.9	18.5	19.3	17.9	56.0
Bison	15.2	18.4	17.8	17.1	56.0
Long 79	20.5	24.2	22.3	22.3	56.0
Rosquin	18.0	21.1	21.6	20.2	56.0
Morteros	20.0	21.1	20.9	20.7	56.0
Time-of-Planting Test					
December 16					
N.D.R. 114	18.1	--	--	--	56
Rosquin	19.1	--	--	--	57
January 7					
N.D.R. 114	8.5 2/	--	--	--	55
Rosquin	12.2 2/	--	--	--	55
February 7					
N.D.R. 114	13.4 2/	--	--	--	52
Rosquin	11.8 2/	--	--	--	53
March 2					
N.D.R. 114	9.2 2/	--	--	--	52
Rosquin	8.2 2/	--	--	--	52

1/ Average of six check plots.
2/ Very poor stands due to wet, cold weather and competition with winter weeds.

Summary of the Climatological Data for the First Three Weeks of June

Week ending	Temperature						Precipitation	Aspect of the Sky		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean						
							Inches	Days	Days	Days
June 6	93	89.1	55	65.3	77.2	28	--	3	4	0
" 13	98	96.0	68	70.7	83.4	27	.06	1	6	0
" 20	99	97.0	67	72.6	84.8	29	.38	1	5	1

Official visitors during this period were H. V. Jordan, Associate Soil Technologist, June 4; D. C. Neal, Senior Pathologist in Cotton Diseases, and K. C. Gunn and R. E. Wester, assistants, June 15-17; Paul R. Dawson, Associate Biochemist, and J. H. Hunter, Assistant Soil Technologist, June 15.

Geo. T. Ratliffe.

Scotts Bluff

Note: This report was inadvertently omitted from the previous issue.

The average maximum temperature for the week ending June 6 was 80°, with a maximum of 90 on the 3d; the average minimum was 46, with a minimum of 43 on the morning of the 2d. The precipitation amounted to .37 inch, making a total of 2.59 inches for the growing season as compared with 7.68 inches for the same period last year. The total evaporation was 1.34 inches. The average hourly wind movement for the week was 8.4 miles.

During the week the sorting of potatoes was completed and the plowing of the potato plots in field K was finished. A part of the alfalfa field on the Walker tract was plowed and prepared for the planting of potatoes in some tests to be conducted by Mr. H. O. Werner of the Nebraska College of Agriculture.

Water has been run continuously on both places all week. The Walker tract has been covered once, and the pasture plots on the station have been watered. Water was started on some of the alfalfa plots in field K the latter part of the week. The rainfall during the week came in three small showers. It was of considerable benefit to the alfalfa and sweet clover seeding.

Another truck load of hogs was sold at the local auction, bringing a little more than the market price. All livestock prices are down to the lowest level for years. Omaha tops on Saturday: $8.35 for choice yearling steers, $6.00 for hogs, and $9.50 for wooled fat lambs. Eggs and butterfat remain stationary at 12¢ and 17¢.

The Cooperative Cheese Company has added ice cream equipment to its plant and is now manufacturing ice cream, butter, and cheese.

A few farmers throughout the valley have commenced irrigating beets up. About the only logical crops to plant now, if the beets fail to come, are potatoes and beans.

The average maximum temperature for the week ending June 20 was 92°, with a maximum of 97 on the 16th; the average minimum was 58, with a minimum of 49 on the morning of the 17th. There was no rain at the station during the week. The average hourly wind movement was 6.8 miles. The total evaporation was 1.92 inches.

The weather has been extremely dry and hot. The average maximum and minimum temperatures were 6° higher than for the same week last year, and the evaporation was .5 inch more than for the corresponding period a year ago. The demand for irrigation water has been heavy, but the rotation system generally has not been put into effect. The Water Users boards are urging care in the use of water so that none may be wasted.

Officials of the Great Western Sugar Company have been holding meetings and urging beet growers to begin irrigation in order to save the beets that are up. Much beet acreage is being abandoned and replaced with other crops, principally potatoes.

The potato plots in fields K and E were planted during the week. They were then cultivated and ditched, and for the first time at the station it was necessary to irrigate them to start them off. The beet plots in field E have been irrigated twice but have not yet been thinned. The beets in field K have been thinned and irrigated and are making rapid growth, but they will require frequent irrigations. All crops that have moisture are making rapid growth.

Scotts Bluff (cont'd)

Another planting of potatoes was made for Mr. Werner, of the University of Nebraska. This was on the Walker tract. This test used potatoes from the various rotations to determine the effect of the different cropping systems on them when used as seed.

The price of hogs has made a very nice increase in the last week, having reached a top of $7.50. The prices for sheep and cattle continue to decline.

The average maximum temperature for the week ending June 27 was 96°, with a maximum of 102 on the 23d; the average minimum was 61, with a minimum of 57 on the morning of the 22d. The total evaporation was 1.781 inches. The average hourly wind movement was 5.6 miles. There was no precipitation.

The week has been the hottest for this season of the year that has ever been experienced since the station has kept records. Where moisture conditions have been good crops have made a splendid growth. The first cutting of alfalfa commenced this week, and it is going into the stack in the very best condition. Where grain has had water it gives promise of good yields. Some of the early barley is beginning to ripen.

There have been a few local showers on various parts of the project, and in the vicinity of Bayard and Minatare there was a hailstorm the first of the week that did some damage.

Water is now delivered to the farmers in the irrigation district on a rotation basis, which rigidly limits the amount used. The last report on the storage of water in the Pathfinder and Guernsey Reservoirs gives a total of 604,730 acre-feet.

At the station water has been run continuously throughout the week. All the grain and sweet clover pasture plots in K and E have been irrigated and the cultivation of all row crops continued. A good stand of alfalfa has been obtained on the irrigated rotation plots. The alfalfa in field H was cut and shocked.

Prices for farm products have made little change since the last report. Butterfat at the creamery has dropped back to 15¢ for sour cream, with a 5¢ premium for sweet cream. The cheese factory has been paying 19¢ a pound for butterfat in whole milk. At these prices there is little or no profit in dairy products. The feed cost of butterfat during the month of May, according to station records, was 18¢ for Lot 1, which receives a grain ration, and 11½¢ for Lot 2, which gets roughage only. Dairymen who have good pastures are making a little profit.

James A. Holden

Yuma

The maximum temperature for the week ending June 20 was 104, minimum 53, and greatest daily range 48. No precipitation was recorded. The wind movement during the week was very slight. Relatively high humidities were recorded during the last two days. This is probably due to storms to the south and southwest.

The U. S. Bureau of Reclamation reports that the peak of the flood stage of the Colorado River has probably passed for the year.

Yuma (cont'd)

The discharge of the river at its highest stage was about 30,000 second-feet. This amount is less than half of the usual flood run-off.

A survey of the alfalfa fields on the project, made during the week, seemed to reveal a very spotted condition. Those fields which were turned to seed earlier have a fair set, but those that reached the blossoming stage during the past two weeks have been stripping the flowers very badly. Thrips in the alfalfa seemed to be more numerous this year than usual, and may account for the poor stand. In the alfalfa-producing sections of the lower Gila Valley the fields have been dusted by means of an airplane. This work is in the nature of trials and demonstrations in the use of various insecticides.

Station work during the week included the plowing of alfalfa plots to be planted to grain sorghums; disking, harrowing, and planting grain sorghum plots; cultivating cotton; and general irrigating and hoeing. All the Pima cotton on the station was rogued during the week by Messrs. Harrison and Fulton, of the Division of Egyptian Cotton Breeding.

Other station visitors during the week were R. E. Blair, of the Division of Crop and Livestock Estimates of California, and J. E. Hite, of the U. S. Cotton Field Station at Shafter, California.

E. G. Noble.

M I S C E L L A N E O U S

A manuscript entitled "Measuring the Salinity of Irrigation Waters and of Soil Solutions with the Wheatstone Bridge," by Carl S. Scofield, has been submitted for publication as a technical bulletin.

WEEKLY REPORTS

Of The Division Of

WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

Vol. XXXIII July 4 and 11, 1931 No. 13

Belle Fourche

The maximum temperature during the week ending July 4 was 106 and the minimum 43. The precipitation was .46 inch.

The past month was the hottest June, with one exception, in the history of the station. The mean temperature was 72°, one degree lower than the high record of June 1911. The precipitation last month was 1.24 inches below normal. A total of only 4.96 inches of precipitation has been received during the first half of the current year as compared with an average for the six-month period of 8.55 inches. The total evaporation for June was 7.45 inches, which is .88 inch in excess of the average. The maximum evaporation during any one day was .404 inch.

On July 2 some hail fell at the station, but it did no serious damage to crops. On the eastern end of the project, in the vicinity of Willow and Nine Mile Creeks, the crops were badly damaged and about 10 per cent were totally destroyed. There was no appreciable rainfall except in the area where it hailed.

During the week the hauling of hay was completed and all crops were irrigated.

The maximum temperature during the week ending July 11 was 99 and the minimum was 46. The precipitation was .04 inch.

The work for the week consisted of thinning the replanted beets, hoeing all row crops, and irrigating alfalfa pastures, small grain, and flax.

The hot dry weather continues, the small grains are beginning to ripen, and harvest will be earlier than usual.

Dr. C. E. Leighty, John M. Stephens, and T. K. Killand, of the Division of Dry Land Agriculture, and R. S. McIntosh and Mr. Butler, of the University of Minnesota, visited the station on July 5.

Beyer Aune.

Huntley

The maximum temperature for the week ending July 4 was 103 and the minimum 41. No precipitation was recorded. Dry weather continued in this section during the week, but heavy rains were reported from other parts of the State where conditions of drought during the season have been severe. This should relieve for awhile the situation as to range feed and water, although many sections are reporting a serious shortage of irrigation water. Range stock are being moved to sections of the State, or to other States, where feed is available.

Huntley (cont'd)

The supply of water in the Huntley Canal is still adequate for all needs, although the flow in the river has decreased during the past few days and it is not possible to fill the canal to capacity.

The harvest of the first cutting of alfalfa was completed during the week. All crops are being irrigated. Other station work included the cultivation of row crops and repair work on the irrigation system.

Mr. Robert E. Wall, Entomologist of the Montana Agricultural Experiment Station, visited the station during the week to study insect damage to beans.

Dan Hansen.

Newlands

The average maximum temperature for the two-week period ending July 4 was 89, with a mean maximum of 95 on July 2; the average minimum was 48.3, with a mean minimum of 40 on June 29. The mean temperature was 68.6. The average hourly wind movement was 2.9 miles. There was no precipitation.

During this two-week period the greater portion of the field work has been cutting, shocking, and stacking first cutting of alfalfa hay. The yields on the various plots varied from 1,891 to 4,796 pounds per acre.

One irrigation was given all cropped plots on the station. One more irrigation may be available before the supply of irrigation water is depleted; if so it will result in a fair second crop of hay. This is a little better than we expected at the opening of the season. However, the project farmers have been very economical in their use of water and all available supplies of water are being utilized, so that the small stored supply has been conserved.

The barley on the station has been cut and is now in the shock.

E. W. Knight.

Prosser

Report for week ending July 4

More rain was received during the last month than in any preceding month of June since 1926. The rainfall during that month for the past seven years is as follows:

Year	Inch
1925	0.11
1926	.86
1927	.23
1928	.58
1929	.66
1930	.00
1931	.80

The mean maximum temperature for June was 80.2 and the mean minimum was 50.3. The monthly evaporation was .055 inch. The mean hourly wind velocity was 2.1 miles per hour.

The cultivation of corn has been almost completed. The potatoes will soon be large enough to cultivate. Most of the alfalfa

Prosser (cont'd)

fields have been irrigated. Wheat is ripening quite rapidly and will be ready for harvest soon.

A few saline soil samples have been taken and are being prepared for conductivity determinations. Results from resistance trials on weekly samples of water from the Sunnyside Canal are being rechecked.

The report on the shortage of irrigation water is more favorable now than at the first of the season. The amount of water allotted to the district in which the station is located has been reduced very little. Water in storage on June 29 was 498,163 acre-feet and on July 3 was 485,329 acre-feet.

The maximum temperature during the week ending July 11 was 99.5° and the minimum was 49.5.

The amount of irrigation water received at the station remains about the same as last week, but the allotment is a little short of normal July deliveries. Between the 3d and 8th of July there was a decrease of 27,935 acre-feet of water held in storage.

A new shop under construction at the station is rapidly nearing completion.

Apricots are now on the market and are selling for 75 cents a crate on board cars. The price to growers has been steady at $30 per ton. For small lots of Yellow Transparent apples, growers received $40 per ton during the middle of the week. At the close of the week cash buyers lowered their offers to $30 per ton for Yellow Transparent and Gravenstein, and other varieties were taken at $20 a ton. The tomato crop in the Wapato district has done better this season than in the average season. Little blight has appeared, as the cool weather in June tended to promote a healthy growth. Last year the valley shipped 312 cars of tomatoes, but this season the dealers will be in a position to sell 300 to 600 cars provided the market will absorb them. The price has not been established yet. In Walla Walla a price of $2.00 per lug has been asked. The outlook for new potatoes at the week-end was much improved due chiefly to the dwindling supply of the Irish Cobbler variety. This enabled the shippers to advance their quotations to $18 a ton and some are asking $19 a ton. The growers received 40 to 50 cents a box for peaches; the f.o.b. quotation was 60 to 65 cents for desirable sizes and 40 to 50 cents for small sizes. Growers are receiving 1½ to 2 cents a pound for dry onions in small lots. Alfalfa hay is selling for eight to nine dollars per ton.

Carl A. Larson.

San Antonio

Report for the two-week period ending July 4

The last week of June and the first week of July were somewhat cooler than the preceding two weeks of June. Beginning on June 26 a four-day period of rain began which effectually broke the drought that was becoming severe. Although some corn in the more favorable soils was not suffering for moisture, the major portion of the crop in the San Antonio area was in a critical condition. It is believed that all the corn on the station was greatly benefited, as none had burned to the ears. As grain sorghums were ripening rapidly the rain was more harmful to them than beneficial. A great deal of lodging was caused and much grain will be lost because of the resulting

San Antonio (cont'd)

sprouting in the heads. Cotton was not yet in need of additional moisture and with the 3.34 inches of precipitation received at this time, most of which went into the ground, the plants should be able to mature a first picking without additional rainfall.

Boll weevils were becoming abundant in the cotton, and poisoning was started June 23. The rains interfered with the schedule of dustings which should have followed, and a new group was started July 2. Three dustings are being made at four-day intervals. Cotton rootrot was unusually late in appearing in the fields this year and, notwithstanding the abundant supply of winter moisture, has spread very slowly to date.

Summary of Meteorological Data

Week ending	Temperature						Precipitation	Aspect of the sky		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean						
							Inches	Days	Days	Days
June 27	97	91.7	68	70.0	80.9	28	1.84	2	2	3
July 4	93	89.9	69	71.6	80.7	23	1.54	3	2	2
Month of June	99	93.2	58	70.4	81.8	29	3.82	8	16	6

It will be noted that the San Antonio region has escaped the heat wave which has been so severe further north.

Official visitors during this period included Messrs. Hunter and Nelson, of the Bureau of Chemistry and Soils.

Moderate temperatures prevailed throughout the week ending July 11, but the relative humidity was high. Heavy dew occurred every night, but no rain was received until Saturday afternoon and night. Two torrential showers of relatively short duration on that day were accompanied by strong winds which broke limbs from many trees, upset shocks of sorgo and grain sorghums, and caused much lodging of late sorghums and corn.

Station cotton was dusted with calcium arsenate at the rate of 8 pounds per acre on July 6 and 10.

The grain sorghum variety test, except two late varieties, and milo in the rotations were harvested. Three men circulating through these fields with shotguns since June 20 prevented the birds from doing a great deal of damage. A heavy rain June 26 caused severe lodging; many heads which touched the ground were a mass of small sorghum plants when harvested.

Other station work during the week included the cultivation of all cotton, cultivation of orchards, and harvest of the last two time-of-planting plots of flax.

The maximum temperature was 98, mean maximum 95.7, minimum 64, mean minimum 71.0, mean temperature 83.3, and the greatest daily range 31°. Three days were clear and four were partly cloudy. The precipitation totalled 1.72 inches.

Geo. T. Ratliffe.

Scotts Bluff

The average maximum temperature for the week ending July 4 was 90°, with a maximum of 102 on the 28th; the average minimum was 57, with a minimum of 45 on the night of the 4th. There was one light shower during the week amounting to 0.14 inch, making a total for the growing season of 2.81 inches as compared with 8.18 inches last year, 3.72 inches for 1919, the other dry year, and a 22 -year average of 6.67 inches. The total evaporation for the week was 1.75 inches, a daily average of .25 inch. The average wind movement was 6.9 miles per hour.

During the week the alfalfa was cut, and it was stacked in good condition. The yield on the plots was very good. The past two weeks have been ideal for haying, for it has been very dry and hot. Not only has it been the hottest but it has also been the dryest June since the station records were started.

Grain crops that have been irrigated are in good shape. Barley is beginning to ripen. Wheat in the dry land area is almost ready to harvest, and in some sections a fairly good yield is indicated. A good deal of it, especially in thin soil areas, has not filled well and the quality will be poor.

Water has been run continuously throughout the period and the crops have been kept in very good condition. The beets in field E have been thinned, but the stand is very poor and the weeds are very bad. There is a very good stand of potatoes.

There has been little change in the prices of farm products. Dairy products have advanced 2 cents, but there has been a slight decline in livestock prices.

The average maximum temperature for the week ending July 11 was 86°, with a maximum of 98 on the 10th; the average minimum was 55, with a minimum of 43 on the morning of the 6th. There was no rain during the week. The average hourly wind movement was 7.5 miles. The evaporation for the week was 1.991 inches.

The week has continued dry and hot, but at the station we are well up with the watering. During the latter part of the week a night irrigator was put on and all of the corn plots were irrigated thoroughly. All crops are doing well and are making rapid growth.

In field E the beet plots in rotations 13, 15, 19, 43, and 47 have been abandoned because the stand was so poor and the weeds were so bad. These plots and the phosphate test plot along the east side of field K were irrigated, disked, and planted to potatoes. The irrigation and fertilizing test for sugar beets in field C was so badly infested with weeds that it was necessary to plow it. All of this field was irrigated before it was plowed. It was then disked and worked down; a part of it was again irrigated before planting and the rest after planting.

Wheat harvest has commenced on the project, but the dry land sections have not started their combines. The yield will be fairly good in most sections, but it seems that the price will be only about 23 cents a bushel. The yield of barley is going to be rather low in some sections on account of the ravages of a rootrot disease that infests many fields. It is not very serious on the station fields.

With the beginning of grass cattle shipments, the price of finished steers has strengthened, and due to a shortage of that kind of

Scotts Bluff (cont'd)

stock the price will probably continue to advance. The station has a carload of prime steers to market the latter part of the month.

James A. Holden

Umatilla

The maximum temperature during the week ending July 11 was 102, minimum 46, and greatest daily range 52°. No precipitation was recorded. A severe drying wind on the 10th and a temperature of 101° did considerable damage to growing crops.

The general work on the station during the week consisted of irrigating and weeding.

On the new station site the grubbing of brush was completed, but there still remains some raking and burning which will probably take about a week. The cost to date has been slightly over $4.00 per acre. On approximately 30 acres it was not necessary to use the tractor and grubber, but on a considerable portion of the tract it was necessary to pull heavy sage brush and buck brush with the tractor prior to grubbing.

Mr. H. L. Westover and Mr. L. W. Kephart, of the Division of Forage Crops and Diseases, spent a day going over the alfalfa and sweet clover tests. They were both consulted as to future forage crop investigations on the new station.

Dr. G. E. P. Smith, of the Department of Agricultural Engineering, University of Arizona, and Mr. H. S. Harding, of the Irrigation Department, University of California, stopped at this station while on tours of the Northwest, inspecting irrigation works and problems.

Mr. M. R. Lewis, of the Bureau of Agricultural Engineering, spent two days on this station making plans for the irrigation system.

Messrs. E. S. Schultz, M. Shapovalov, E. Blood, and B. F. Dana, of the Division of Horticultural Crops and Diseases, spent one day at this station reviewing the curly top investigations. These men were on a traveling conference covering the work in Utah, Idaho, and Oregon. Mr. B. F. Dana is detailed to Oregon. His headquarters are at Corvallis on account of laboratory and greenhouse facilities and supervising the field work on this station.

H. K. Dean

Yuma

The maximum temperature for the two-week period ending July 4 was 114, minimum 71, and the greatest daily range 43. No precipitation was recorded. The mean maximum for the month of June was 101, mean minimum 63, mean 82. For the last five days the maximum temperature has averaged 111 degrees.

The discharge of the Colorado River for the month of June was 1,244,000 acre-feet. This is a new low record for June, which is only about one-half the former low record set in 1919. The 29-year average for the month is 4,133,000 acre-feet.

The warmer than normal temperatures during the months of May and June seem to have been very favorable for the early setting of cotton bolls. From present indications a very good bottom crop has been set.

Yuma (cont'd)

The cotton fields, a a whole, on the project are in very good condition.

The harvesting of the alfalfa seed has started on the project, and favorable yields are being reported. There is a wide variation between the prices of alfalfa seed quoted by the buyers and sellers and very little seed, if any, is moving. The harvesting of cantaloupes has slowed up during the past two weeks on account of the poor prices.

An active demand for good lettuce land seems to be developing in this section as the low stage of the Colorado River indicates a probable shortage of water for early lettuce plantings this fall in the Imperial Valley. Summer rains in northern Arizona have in the past added enough water to the Colorado River in July, August, and September for irrigation during the period when the river was low. This year, however, with the stream carrying about one-half its normal amount of water, a shortage is definitely indicated.

Station work has included the harvesting of alfalfa hay on the A series, plots 1 to 8, cultivating and thinning grain sorghum plots, cultivating and hoeing cotton, grubbing and clearing mesquite areas, cleaning and repairing ditches, repairing pumps and pipe lines, and general irrigating.

The maximum temperature for the week ending July 11 was 112, minimum 72, and greatest daily range 40. There was a trace of precipitation. High temperatures with high humidities have been recorded for the last three weeks. Thunderstorms with heavy local showers are being reported in Arizona. The nearest rain of any significance occurred near Gila Bend, Arizona, on July 9. A heavy cloudburst was reported from that area.

The shedding of squares and small bolls, which usually occurs during periods of humid weather, is reported in all sections of the project. The plots of Pima on the station, however, have shown very little shedding up to the present time.

The harvesting of alfalfa seed continues on the project with about normal yields of from 300 to 400 pounds to the acre being reported. The Mohawk Valley in Arizona continues to report serious infestations of the tarnished bug (Lugus elisus Van Duzee). Experiments with dusting by an airplane to reduce the numbers of this insect are being continued. The yields of alfalfa seed in this district will be seriously affected by this infestation, especially from those fields that were turned to seed after the second cutting of alfalfa hay.

Station work included the planting of the grain sorghum nursery on B-19; harvesting the sugar beet selections for seed on B-18; thinning and cultivating grain sorghum plots on the rotations; harvesting the fourth cutting of alfalfa hay on the rotations; cultivating and thinning corn plots; repairing the station domestic water system; cleaning and repairing ditches; general irrigating and cultivating.

E. G. Noble

M I S C E L L A N E O U S

Mr. S. H. Hastings, Principal Agronomist, left Washington July 20 for a field trip to the northwest. He expects to be gone about a month.

W E E K L Y R E P O R T S

Of The Division Of

WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

Vol. XXXIII | July 18 and 25, 1931 | No. 14

Belle Fourche

The maximum temperature during the week ending July 18 was 105 and the minimum 56. The precipitation was .04 inch. Four days during the week the temperature was 100 or over.

No rains have occurred on the headwaters of the Belle Fourche and Red Water rivers, and water in the Belle Fourche reservoir is at a very low level. Some of the farmers have already used their allotted quantity of water. Several pumps have been put in on the Belle Fourche river to save some of the beet crop located along the river that can be reached by pumping.

During the week the corn, potatoes, and beets were irrigated in fields A and M P. Towards the end of the week all plots were cultivated. The balance of the work consisted of general cleaning up and leveling land on Deadman Creek, using tractor and tumbler fresno.

The farm picnic and the Butte County fair will not be held this year.

Beyer Aune.

Huntley

The maximum temperature for the two weeks ending July 18 was 104 and the minimum 46. No precipitation was recorded. Crop conditions continue to be unfavorable due to the prolonged drouth and hot weather. The supply of water for irrigation is becoming short since the river has fallen to a point where it is possible to fill the canal to only about 70 per cent of its capacity. The canal is now carrying about 430 second feet while it has a capacity of 600 second feet.

An effort is being made to construct a temporary brush and cable dam in the river to divert more water into the canal.

An extra force of men is employed at irrigating in order to use water on the plots during all daylight hours and on a 24-hour schedule in fields where this is possible.

The situation with regard to the water supply should be relieved somewhat within the next 10 days upon the completion of irrigation of grain and beans.

Visitors at the station during this period were Messrs. Robert E. Wall and Elwood Morris of the Montana Experiment Station.

The maximum temperature for the week ending July 25 was 105 and the minimum 45. No precipitation was recorded. Unusually hot weather prevailed during the week; maximum temperatures of 104 to 105 being recorded on four days. Hot winds and dust storms occurred almost daily and resulted in some injury to crops that were not recently irrigated.

Huntley (cont'd)

The shortage of irrigation water is becoming more serious and work is being rushed on the construction of a temporary cable and brush dam in the river at the canal intake. It is expected that this dam will be completed within a week and the water raised sufficiently to fill the canal to capacity.

In some of the older irrigation sections in the upper end of the valley the water shortage is becoming more acute than on the Huntley Project and will result in serious crop losses.

Irrigating was the principal work performed on the station during the week and it was necessary to continue working two 8-hour shifts in order to make the best use of the water that was available.

Station visitors during the week were Prof. Clyde McKee of the Montana Experiment Station and Messrs. Allen Clark and Karl Quisenberry of the Division of Cereal Investigations.

Dan Hansen.

Newlands

The average maximum temperature for the two-week period ending July 18 was 95, with a mean maximum of 101 on the 18th; the average minimum was 52, with a mean minimum of 47 on the nights of the 11th and 15th. The mean temperature was 73. The average hourly wind movement was 2.5 miles. There was no precipitation.

During this two-week period the work has been mowing irrigation ditches, cutting wheat, and cultivating the orchard. Two plots still remain to be harvested due to some of the wheat being grown in the variety tests not maturing as rapidly as others.

The water situation does not change and the week of July 20 will see the final irrigations being given. One more application of water to all crops at the station is expected. This lack of water will probably result in some damage to crops. It is expected that the pasture crops will die necessitating their replanting next spring if the water situation improves during the winter. It is hoped that the old alfalfa plantings will come through the dry spell without any particular damage, but there is the possibility of harm being done from the lack of water.

Some infestation of grasshoppers is reported from localities in the project.

The boron survey work is still progressing very satisfactory. Extensive reports are prepared upon the completion of each set of water samples. Before long there should be compiled from this source enough data to warrant its use in some further report of such work that is being conducted here as well as in California.

E. W. Knight

Prosser

Report for week ending July 18

The maximum temperature for the week ending July 18 was 98.5 and the minimum was 46.5.

The corn and potato crops on the station have been cultivated and are now being hoed. Wheat harvest will begin July 20.

Many of the valley farmers have cut their second cutting of alfalfa and are beginning their wheat harvest.

The fertilizer plots for alfalfa have been prepared, fertilized, and seeded. The object of this experiment will be to find a fertilizer that will increase yields or prevent yields from declining.

The acre-feet of storage water on July 17 was 396,712 for the Yakima Irrigation Project. There was a decrease of almost 100,000 acre-feet since July 1. Nearly normal deliveries will be made from the Sunnyside Canal until August 1. The conductance, K x 10^{-5}, of water from the Sunnyside Canal was 11.2 on July 16.

Hay is still selling for $8.00 to $9.00 per ton and combination grade potatoes for $12.00 per ton. August delivery wheat is selling at 39 cents per bushel. Butterfat has increased one cent and now sells for 22 cents per pound.

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the week ending July 18 was 95°, with a maximum of 106 on the 14th; the average minimum was 63, with a minimum of 59 on the morning of the 16th. There was no rain during the week. The total evaporation for the week was 1.942 inches, a daily average of .277 inch. The average wind movement was 5.9 miles per hour.

All heat records since 1910 were broken during the past week. The temperature of 106° recorded on the 14th was 4 degrees hotter than any day since 1910. The former record of 102 degrees was reached on July 7 and 16 of 1930. This, so far, has been the driest month of record within the growing season.

The water situation is still grave. There is a combined storage in the Pathfinder and Guernsey reservoirs of about 365,000 acre-feet and a daily outflow of about 10,000 acre-feet. It is stated by the Pathfinder Irrigation District officials that water will be available until about September 1. As the farmers use up their allotted 2 acre-feet per acre, their gates will be closed down and the demand on stored water will decrease.

Water has been run continuously during the week. The beets and potatoes in field E have all been watered and are making rapid growth. The potatoes have come up to a very good stand. The station is now up to schedule with its irrigation and none of the crops are suffering and has a sufficient water supply left to last until September 1.

The barley on the Walker tract was cut during the week. There is a good stand of alfalfa and sweet clover on the ground now.

Scotts Bluff (cont'd)

Cream has advanced another 2¢ and is now selling for 20¢ per pound, and eggs remain at 12¢ per dozen. Livestock prices remain at low levels and show little strength.

The average maximum temperature for the week ending July 25 was 95°, with a maximum of 105 on the 25th; the average minimum was 61, with a minimum of 49 on the morning of the 20th. There was no rain during the week. The evaporation for the week was 1.887 inches, a daily average of .27 inch. The average wind movement was 5 miles per hour.

The hot wave has continued through the week. The first part of the week saw a slight drop in temperature, but the last three days of the week the temperature was above 100. This is the third successive week without rain.

Water has been run continuously throughout the week with the exception of part of one day. The water was shut out of the main canal for 6 hours in order to permit the search for the body of a child drowned in the canal. It took several days to lower the water and to again refill the canal, but it was handled so well that on the lower section of the canal water service was discontinued for less than a day. All the potato, beet, and corn plots in field K were irrigated during the week. The grain plots in fields K and E were harvested during the week.

Harvesting of wheat in the dry land areas is in full swing now. The yields in many cases are small and a few fields have been abandoned. Harvesting is being done on contract in some sections as low as $1.50 per acre. Wheat is bringing from 15¢ to 20¢ per bushel at local elevators.

The combined storage in the Pathfinder and Guernsey reservoirs at the end of the week was 296,410 acre-feet, a decrease of over 68,000 acre-feet during the week.

Mr. H. P. Davis, Chairman of the Dairy Husbandry Department of the Nebraska College of Agriculture, visited the station during the week conferring with the Superintendent on the work being done in the dairy herd.

James A. Holden.

Yuma

The maximum temperature for the week ending July 18 was 110, minimum 73, and the greatest daily range 36. No precipitation was recorded. High maximum temperatures and very humid weather have continued during the week. There has been some wind movement, but mostly in the form of dust storms of a short duration. The rains in northern Arizona have contributed some water to the Colorado River. As the gauge readings show about equal amounts at the Grand Canyon and Yuma gauging stations, the discharge of the river at present is less than 7,000 cubic feet.

Yuma (cont'd)

The reports from the alfalfa seed threshers show that the yields are quite variable. Some growers report higher than average yields while others have been disappointed, having a lower turn-out than was expected. There is very little activity in the alfalfa seed market and no prices are being quoted. One of the banks in Yuma has provided a fund of $250,000 to assist the seed growers in carrying their crop until the market develops.

Station work included the finishing of the third crop of alfalfa on the new plantings on the rotations, thinning and cultivating grain sorghums, cleaning and repairing ditches, repairing station water lines, general irrigating, hoeing and cultivating.

Dr. Kearney, Dr. Webber and Mr. Geo. Harrison were station visitors on the 17th and rogued all the Pima cotton plantings on the station for the second time. Dr. W. T. Swingle and Mr. Frank Thackery visited the station on July 13th.

The maximum temperature for the week ending July 25 was 113, minimum 73, and the greatest daily range 36. The precipitation was .22 inch. The period of high temperatures and humidities which have continued for the past six weeks was varied somewhat to include a wind storm with a local shower on the 22nd. The high wind uprooted eight Eucalyptus trees along the east side of the station and one near the hay shed. Slight damage to buildings and trees were reported from scattering sections of the project. With the exception of some lodging on the ranker cotton plots, there was no damage to crops on the station. The high wind, however, caused considerable loss in alfalfa fields that were cut, shocked, and ready for threshing.

The harvesting of the alfalfa seed crop continues with only a slight interruption on account of the storm. The discharge of the Colorado River at Yuma shows that the flow has decreased below the 5,000 second ft. figure. Reports from the Imperial Valley indicate that a shortage of water is being felt in that section. The recent storms in Arizona may contribute sufficient water to carry over the present shortage.

The Arizona Quarantine Station at Yuma was closed on the 22nd along with twelve other stations in Arizona. The farmers on that portion of the project which is included in Yuma County are very much concerned about the closing of not only the station at Yuma but the one at Gila Bend. Plans are being discussed to raise local funds to maintain these two stations for the protection of the crops in Yuma County. A delegation of Yuma people which conferred with Governor Hunt of Arizona last week was unable to secure any promises of assistance from that source.

Station work included the thinning and hoeing of corn plots, cleaning and hoeing ditch banks, threshing alfalfa seed, clearing and removing fallen trees, general irrigating and cultivating.

E. G. Noble.

W E E K L Y R E P O R T S

Of The Division Of

WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

Vol. XXXIII August 1, 8, and 15, 1931 No. 15

Belle Fourche

The maximum temperature during the week ending July 25 was 105 and the minimum was 50. There was just a trace of precipitation.

During the week the alfalfa, beets, corn, and potatoes in fields A, M-P, and G were irrigated, also the orchard and shelter-belt plantings. The corn and potatoes in field A were cultivated. The barley in field K and the barley and oats varieties in fields O and P were harvested. All plots of cultivated crops in fields A and M-P that were weedy were hoed. The leveling of field O was continued and a start made in field P. All labor not needed elsewhere was used to dig a drain in field O.

During the week several forest fires started in the Black Hills area. One fire near Deadwood is particularly severe. It is reported that about 1500 men are engaged in fighting the forest fires.

During the week ending August 1 the maximum temperature was 108 and the minimum 56. The precipitation was .70 inch. The last three days of the week were cloudy and much cooler. On August 1 there was .64 inch of precipitation, which benefited the irrigated crops considerably.

During the week the barley and oats in fields A and M-P were harvested and also the barley in field Y. The potatoes in fields A and M-P and the corn in fields O and M-P were cultivated. The corn in field I was irrigated. The work of leveling fields O and P and digging the drain in field O was continued. The alfalfa in fields A, M-P, O, and P was mowed and will be stacked next week.

The forest fire reported last week is said to be under control. A temporary camp has been established at Galena and a sufficinet number of men will be kept there to control the blaze should high winds spread the fire again. Damage was limited almost entirely to timber.

Mr. J. A. Clark and Mr. Karl S. Quisenberry, of the Division of Cereal Crops and Diseases, visited the station July 26.

The maximum temperature for the week ending August 8 was 98 and the minimum 52. The precipitation was .31 inch. The weather for the week as a whole was considerably cooler than the preceding week.

The first part of the week the second cutting of alfalfa was stacked and the wheat in fields M-P, P, and A and the flax in fields M-P and A were harvested. The latter part of the week the flax varieties in field G were harvested. All beets, corn, and potatoes in fields M-P, O, and G were irrigated and also the alfalfa in M-P and west P and the sweet clover in field G. On August 8 the irrigation of the beets, corn, potatoes, and alfalfa in field A was started. The digging of the drain in field O and the leveling in field I were continued. Plowing up the old alfalfa in field P was started.

Belle Fourche (Cont'd)

The maximum temperature for the week ending August 15 was 102 and the minimum 71. A trace of precipitation occurred on August 15. The precipitation to August 15 is 5.24 inches below the average for 23 years.

The irrigation of the beets, corn, potatoes, and alfalfa in field A was completed.. On August 10 the barley and oats in fields M-P, A, K, and Y were threshed. The alfalfa and sweet clover planted with a nurse crop in fields A, K, and Y were irrigated after the grain had been removed and threshed. The alfalfa in field W, the corn in field I, mixed grass pasture in field G, the beans in field F, and the beets in field G were irrigated. The wheat in M-P and A and the wheat, barley, and oats varieties in fields P and O were threshed with the small thresher.

Mr. C. S. Scofield and Mr. S. H. Hastings visited the station August 12 to 15. Prof. James W. Wilson, State Agricultural College, Brookings, South Dakota, visited the station on August 14 to confer with Mr. Scofield and Mr. Hastings in regard to the proposed cooperative work between the Department of Agriculture and the State College of South Dakota.

Beyer Aune.

Huntley

Report for two weeks ending August 15

The maximum temperature recorded during this period was 100 and the minimum 45. The precipitation was .71 inch. A rainfall of .61 inch on August 7 was the first rain of consequence in several months. This rainfall occurred in a heavy downpour accompanied by high winds and hail that slightly damaged crops on the station and on other parts of the project. In the same storm over an area about ten miles wide and 100 miles long, extending from Billings to Hardin, the damage from hail was very serious and resulted in almost total loss of crops in much of this area as well as killing numbers of stock.

Station work during this period included irrigating of cultivated row crops and harvest of the second cutting of alfalfa and grains. The average yield of the second cutting of alfalfa in the irrigated rotation experiments was 1.87 tons per acre. The average yields of the second cutting of alfalfa in the variety test on field O were as follows:

Grimm	2.09	tons per acre
Ladak	2.02	" " "
Common	2.01	" " "
Cossack	1.83	" " "
Baltic	1.68	" " "

The annual Huntley project picnic was held on August 15. There was an estimated attendance of 1,200 people.

Messrs. C. S. Scofield, S. H. Hastings, F. D. Farrell, and Beyer Aune were station visitors during the week ending August 8.

Dan Hansen.

Newlands

The average maximum temperature for the two-week period ending August 15 was 100, with a maximum of 99 on the 10th; the average minimum was 59.3, with a minimum of 45 on the 9th. The mean was 79.6. The average wind movement was 2.14 miles per hour. There was .07 of an inch of precipitation during this period.

The second crop of hay has been cut and stacked. The average yield of the various alfalfa plots was 2,878 pounds per acre, which was 278 pounds less than the average yield of the first cutting. This completes the hay crop for this season. On account of the shortage the price of hay has increased a little. Offers of $10 per ton when fed to beef stock are being received by some local growers.

The threshing of the grain crops at the station is underway and should be completed in a day or two.

The State is contemplating the construction of more corrals and shelters for the young stock.

E. W. Knight.

Prosser

Report for week ending July 25

The twelfth annual field day was held at the station July 22. Many farmers and investigators from various parts of Washington and Oregon visited the station at that time. The entire morning was devoted to a field trip and specific problems were discussed during the afternoon.

Most of the wheat crop has been harvested and is ready to be threshed. The corn and potatoes have been hoed. Cutting of the second crop of alfalfa will begin next week.

Water deliveries to the station have been normal for the past week.

A maximum temperature of 104 occurred on July 20. The minimum for the week was 47 and the greatest daily range was 50.

Report for week ending August 1

All of the wheat has been harvested and threshed except the experimental plots. The average yield from the various fields was 37 bushels per acre. The second cutting of alfalfa is in progress now. About 20 acres of hay were cut and stacked this week. The alfalfa hay plots will be cut the first of next week.

The supply of irrigation water remains normal at the station. About 200,000 acre-feet of storage water was used during the month of July, and there are about 300,000 acre-feet held in storage for the remainder of the season.

The mean maximum temperature for July was 91.1 and the mean minimum was 54.4. The monthly mean was 72.7.

The specific conductance of irrigation water from the Sunnyside Canal was as follows:

Date	$K \times 10^{-5}$
July 16	11.2
July 23	9.9

Mr. S. H. Hastings visited this station from July 29 to 31 to inspect and discuss the experimental work in progress.

Prosser (cont'd)

The cultivation and hoeing of corn was continued during the week ending August 8. The second crop of alfalfa has been cut and stacked. The wheat plots will be threshed next week.

The supply of irrigation water remained normal this week. Water from the storage reservoirs is being used at the rate of 200,000 acre-feet per month. There were 245,000 acre-feet in storage August 8. At the present rate the water supply should remain normal until the middle of September.

Butterfat has advanced in price from 22 to 26 cents. Growers are receiving 65 cents a crate for cantaloupes and 30 to 40 cents for a 20-pound box of ripe tomatoes, while the shippers receive 40 to 45 cents. Apricots are being sold to local canneries for $15 per ton and the market is draggy. Bartlett pears are moving to the New York auction, but the price has not been definitely determined.

During the week ending August 15 corn and potatoes were cultivated and irrigated. Five hundred soil moisture samples were taken from the orchard irrigation plots. Small amounts of asphalt compounds—plastic cement, petrolastic and asphalt emulsion—have been applied to leaky flumes. It is believed that these compounds may be very useful and economical.

The amount of irrigation water received at the station was reduced August 12 because of the conservation of storage water by the Bureau of Reclamation. There were 210,865 acre-feet of water held in storage August 14.

The price of butterfat has advanced two cents this week, which is a little encouragement to the dairymen. Other farm products are quoted as follows: Hay, $8 to $9 per ton; potatoes, combination grade, $13 to $14 per ton; wheat, August delivery, 36 cents per bushel. The movement of peaches from the valley increased this week. Growers received 45 cents per box for Albertas and Early Crawfords. The harvest of Slappy peaches is just about finished, and the growers are receiving 50 cents per box for them. Early shipments of Italian prunes were bringing 40 to 50 cents per box.

The maximum temperature for the first half of the month was 100° on August 1 and the minimum was 45.5 on August 12. The greatest daily range was 45° F.

The specific conductance of the water from the Sunnyside Canal follows:

Date	$K \times 10^{-5}$
August 1	10.95
" 6	10.95
" 13	12.05

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the two-week period ending August 8 was 91°, with a maximum of 104 on the 27th; the average minimum was 60, with a minimum of 50 on the morning of the 2d. In four small showers, the precipitation during the two weeks has amounted to .50 inch, making a total for the growing season of 3.31 inches as com-

Scotts Bluff (cont'd)

pared with 10.48 inches for the same period last year. The total evaporation for the period was 3.806 inches. The average hourly wind movement was 6.2 miles.

The month of July showed the highest temperatures that have ever been recorded at the station. The highest previous temperature was 102°, but for six days in the past month (four of them in succession) the temperature was 102° or higher. The average maximum temperature for the month, however, was just the same as last year and 1 degree lower than in 1929, the average being 92° for 1929 and 91 for July of 1930 and 1931. The average minimum for the month was 59°, which is the highest for July since 1923.

Water has been run continuously during the two weeks, and an irrigator has been with the water day and night. It has been found that a much better use of water can be had where there is a day and night man, and in the present shortage of water it has worked out nicely. Better results can be accomplished with a smaller head. The combined storage in the two reservoirs at the end of the period was 204,880 acre-feet, a decrease for the two weeks of 91,530 acre-feet, or a daily run of about 4,500 acre-feet. Farmers are using water much more economically than they ever did before. At the present rate of consumption it would seem that there should be water even after September 1 for those who have not used their limit.

During the period a carload of fat steers were shipped to Omaha from the station. They brought the top of $7.75 for weighty steers, averaging 1277 pounds.

Preparations are being made at the station for the annual picnic, which will be held on August 13. The Scotts Bluff County Fair Association is issuing its program for the fair next month.

Dairy products are advancing in price. Sour cream is now bringing 23 cents. Eggs have advanced to 15 cents a dozen. Other farm products remain steady at low levels. The prospects for the potato crop in the valley are not very good. There seems to be a general complaint that the potatoes are not setting on as they should, but with cooler weather the conditions may improve.

The second cutting of alfalfa was stacked and the grain plots in K and E were threshed during the period. The grain yields are given in the following table.

Scotts Bluff (cont'd)

YIELDS OF OATS - 1931

Rotation No.	Yields per plot, pounds		Bushels per acre	Ratio of grain to straw
	Grain	Straw		
		Field K		
71	397	563	49.6	1 to 1.42
23	326	354	40.8	1 to 1.08
25	288	512	36.0	1 to 1.78
65	192	328	24.0	1 to 1.92
27	116	284	14.5	1 to 2.45
1	131	169	16.4	1 to 1.29
31	340	450	42.5	1 to 1.32
61	273	527	34.1	1 to 1.93
30	145	215	18.1	1 to 1.48
60	280	450	35.0	1 to 1.60
42	199	311	24.9	1 to 1.56
22	173	187	21.6	1 to 1.08
16	180	200	22.5	1 to 1.11
32	172	138	21.5	1 to .80
62	288	282	36.0	1 to .98
44	313	487	39.1	1 to 1.56
24	140	230	17.5	1 to 1.64
45	286	434	35.8	1 to 1.52
64	239	531	29.9	1 to 2.22
48	206	294	25.8	1 to 1.43
28	114	156	14.3	1 to 1.37
Average	228	338	28.5	1 to 1.48
		Field E		
33	253	357	31.6	1 to 1.41
47 (V- 9)	301	579	37.6	1 to 1.92
(V-11)	271	429	33.9	1 to 1.58
46	213	287	26.6	1 to 1.35
17	239	401	29.9	1 to 1.68
19	236	364	29.5	1 to 1.54
43 (IV-9)	343	477	42.9	1 to 1.39
(IV-11)	294	506	36.8	1 to 1.74
11	119	301	14.9	1 to 2.53
13	308	392	38.5	1 to 1.27
15	314	426	39.3	1 to 1.36
41	322	468	40.3	1 to 1.45
49	146	354	18.3	1 to 2.43
Average	258	411	32.3	1 to 1.59

Scotts Bluff (cont'd)

The average maximum temperature for the week ending August 15 was 90°, with a maximum of 102 on the 13th; the average minimum was 57, with a minimum of 45 on the morning of the 10th. The precipitation amounted to only .03 inch, making a total for the growing season of 3.34 inches. The average wind movement for the period was 6.6 miles per hour. The total evaporation was 1.879 inches.

The annual picnic was held on Thursday of this week, and in some respects it was one of the most successful ever held. A larger percentage of farmers was present and a greater number of them took part in the field inspection trips than ever before. The work of the 4-H clubs at the picnic is assuming greater proportions, and their program was considerably enlarged this year. The attendance was very good, there being between 500 and 600 cars, which would indicate an attendance of between 2500 and 3000 people.

The first part of the week was largely spent in getting ready for the picnic. The irrigation and cultivation of the beets and potato plots was completed the first of the week. Water was off two days during the week.

The water situation has been managed so well that the district officials found it would be possible to give one-fourth of an acre-foot additional. The proportion coming to the station would be about 57 acre-feet. This will make it possible to give the seeding of alfalfa and sweet clover on the Walker tract an irrigation this month. It has stood the drouth remarkably well and an irrigation will save it if there is the normal amount of moisture this winter.

The Asiatic elms on the station are showing the effects of winter injury. The two oldest trees are dead back to the main trunk from which new growth has started. Several of the trees along the entrance drive are dead this year, and others that died two years ago have been replaced. It now seems doubtful that this species should be recommended for general planting in this area because of the behavior of these older trees. It is reported that similar, though less severe, winter injury has occurred at Newell and at Huntley also. These elms have been extensively planted in the towns of this valley and in general the younger trees are still doing well.

Dairy products and eggs continue to advance, cream selling at 24 cents and eggs at 16 cents. Other farm products remain at low levels. Wheat to feeders is selling at 25 to 30 cents a bushel.

James A. Holden.

San Antonio

Report covering the five-week period ending August 15

The summer of 1931 has been unusually cool in the San Antonio region to date. The mean temperature for July was 2° below the average mean for that month during the preceding 24 years, while the maximum for July, 98°, was 4.2 below the mean maximum for the same period. The rainfall for July was 2½ times the normal for the month. Although a few days of high humidity with maximum temperatures in the upper nineties have been quite oppressive, relatively cool weather has continued through August to date. No rain of consequence has been recorded since July 18. Climatological data recorded for the period of this report follow.

San Antonio (cont'd)

Week ending	Temperature						Precipitation	Aspect of the sky		
	Maximum		Minimum		Mean	G. D. R.				
	Absolute	Mean	Absolute	Mean				Clear	Partly cloudy	Cloudy
							Inches	Days	Days	Days
July 18	95	90.1	71	72.4	81.3	24	2.37	2	2	3
" 25	94	91.7	70	73.4	82.6	23	--	3	4	0
Aug. 1	93	91.7	70	72.0	81.9	22	.26	2	4	1
Month of July	98	92.2	64	72.0	82.1	33	4.35	11	16	4
Aug. 8	96	95.1	66	72.3	83.7	30	--	4	3	0
" 15	97	93.3	59	65.3	79.3	35	.05	5	1	1

Cloudy, rainy weather during the middle third of July was of benefit to Johnson grass meadows and hay sorghum crops but was decidedly harmful to cotton. Boll weevils had been effectively controlled by dusting earlier in the season, but the abundant July rainfall promoted a rank growth of cotton plants and encouraged rapid multiplication of the weevils, which are now puncturing all new forms as well as bolls of all sizes. Cotton boll worms increased to serious numbers shortly after dusting was completed. For a period of approximately two weeks they destroyed a large percentage of the squares and earlier set bolls. During the last week of July they were apparently heavily attacked by parasites, and the infestation was almost completely wiped out. Black arm, or Angular Leaf-spot, which is never a limiting factor during a dry season, became very active. Leaf damage was relatively light, but the disease attacked practically all bolls and a large percentage of them will be a total loss. Rootrot spread more slowly than had been expected until the end of July; however, both the number and size of dead areas have increased tremendously during the first half of August. Some cotton on the station began opening during the last week, but a very light crop is now anticipated.

The second cutting of alfalfa from field ABC-7 was harvested. A heavy infestation of alfalfa rust (Uromyces medicaginis Pass.) had destroyed the foliage and darkened the stems to such an extent that the resultant hay was of very poor grade. It was estimated that the alfalfa on more than 10 per cent of the field was dead from cotton rootrot at the time of harvest.

Dwarf milo from the rotation plots and grain sorghums from the variety test were threshed August 3 to 6. A great deal of lodging occurred in the milo on some of the rotation plots during a heavy rain June 26. As many as 40 per cent of the heads on some plots were estimated to have been resting on the ground at harvest time. Most of the grain in these heads had sprouted and was a complete loss. Birds took some of the grain, although loss from this source is believed to have been lighter than usual. The sorghum midge (Diplosis sorghicola Coq.) because of its scarcity early in the season was not a disturbing factor so far as yields from the rotations and earlier flowering varieties were concerned. In the later varieties it caused an appreciable loss. The yields obtained and more pertinent agronomic data recorded are summarized in the following tables.

San Antonio (cont'd)

Sorghum Variety Test - Field D-3 - 1931

(Planted March 10, 1931, in 1/10-acre plots)

Varieties	C.I. No.	First headed	Fully ripe	Height at harvest	Yield per acre-bushels 1st plot	2d plot	3d plot	Average	Average bird damage
Milo:				Inches					Per cent
Dwarf	332	6-2	7-4	52	33.4	34.0	27.7		
					29.9	27.7	35.7	31.4	7.5
Double Dwarf	868	5-30	7-4	54	32.5	22.8	26.0	27.1	8.0
Beaver ...	871	5-29	7-4	34	18.3	17.9	19.6	18.6	8.0
Early Selection		5-27	7-2	44	22.5	19.3	18.2	20.0	8.0
Wheatland	918	6-6	7-16	32	34.0	31.6	(1)	32.8	20.0
Dwarf Hegari:									
S.P.I.35911		5-24	6-1	48	3.4	6.7	6.0	5.4	80.0
Grohoma	920	6-13	7-17	62	14.4	17.2	(1)	15.8	20.0

(1) Seed was received sufficient for planting only two plots each of Wheatland milo and Grohoma.

Note: No appreciable midge damage occurred except in the late flowering varieties, Wheatland milo and Grohoma, and it was estimated their loss from this source was 30 and 40 per cent, respectively.

Yields of Milo In Rotation Plots - 1931

Plot	At Harvest: Per cent lodged	Per cent bird damage	Yield per acre
			Bu.
A4-14	40	5	28.1
-18	50	5	25.0
A5- 2	60	5	34.3
- 5	80	10	39.3
- 7	60	10	38.4
-11	80	10	43.0
-15	75	15	43.8
A6- 1	(1)	(1)	(1)
- 2	(1)	(1)	(1)
- 6	5	20	26.8
-14	60	40	16.0
B4-16	50	5	33.7
19	30	10	34.0
B5-18	10	10	25.4
Average	--	--	32.3

(1) Stand completely destroyed by unnamed milo disease.

During the period a large amount of farm labor has been expended hoeing miscellaneous fields and plots in an attempt to control weeds, which have made unusually luxuriant growth throughout the summer. Other station operations have included threshing flax-nursery rows, irrigating nurseries and orchard A-1, harvesting Johnson grass hay from waste land

San Antonio (cont'd)

in fields ABCE-3, plowing fields BC-3 and C-4 following small grains and flax, and planting the corral pasture to Sudan grass. The slat corn crib was razed and in its place is being erected a new one designed to be well ventilated but rat-proof and easily made sufficiently gas tight to permit efficient fumigation of its contents.

Official visitors were: Paul R. Dawson, Bureau of Chemistry & Soils, U. S. Department of Agriculture, and Henry Dunlavy, Superintendent, Texas Blackland Experiment Station, July 22; H. V. Jordan and Mr. Nelson, Bureau of Chemistry and Soils, July 23; Dr. J. H. Martin, Cereal Crops and Diseases, August 3; J. H. Hunter, Bureau of Chemistry & Soils, August 5; Homer C. McNamara, Superintendent, U. S. Greenville Cotton Breeding Station, and Paul R. Dawson, Bureau of Chemistry and Soils, August 13.

Geo. T. Ratliffe.

Yuma

The maximum temperature for the week ending August 1 was 108°, minimum 74, and the greatest daily range 33. The precipitation was .03 inch. Thunder-storms in the surrounding country, especially in the north and east, have continued to extend the period of high humidity. It is fortunate that most of these storms have passed around the Yuma project so that there has been no damage to the alfalfa seed crop or any lodging in the cotton fields. Excessive shedding of cotton squares and small bolls is still occurring. Many growers report that unless conditions are favorable for a top crop, their yields will be much lower than in the past seasons.

A meeting of the Yuma project cotton growers was held at the station on July 30 for the purpose of going over the Pima plots in the irrigated rotations. About 25 growers attended. This meeting was arranged in cooperation with the County Agent of Yuma County.

The quarantine situation in Arizona has improved to the extent that the stations at Gila Bend and Salome have been reopened to protect the area west of Maricopa County from the pink bollworm infestation in that area. There is considerable political pressure in Arizona to force an extra session of the legislature for the purpose of reopening all thirteen of the quarantine stations. Further evidence of the desire of the State and county authorities to reduce expenses for the coming year is shown by the action of the Yuma County authorities who have recommended that the services of the County Agent be dispensed with, but final action will not be taken until next week.

The shortage of water in the Colorado River is becoming more acute as far as the Imperial Valley is concerned. The discharge of the river on one day during the week was less than 2,000 second-feet. All of this water is being diverted at the canal head for Imperial Valley and half of it is being used for lands in Mexico.

Station work during the week included the planting of a nursery plot of Sesame, cultivating and hoeing grain sorghum plots, clearing trees and brush blown down during the windstorm of last week, cutting grass in the ditches, general irrigating and cultivating.

E. G. Noble.

W E E K L Y R E P O R T S

Of The Division Of

WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

Vol. XXXIII August 22 and 29, 1931 No. 16

Belle Fourche

The maximum temperature for the week ending August 22 was 96 and the minimum 55. The precipitation was .01 inch.

The threshing of flax in fields A, M-P, and varieties in G was completed. This finishes the threshing with the exception of some late-seeded plots in field A.

During the week alfalfa, sugar beets, corn, and beans were irrigated. This will be the last general irrigation that can be had for this year as the level of the reservoir is now down to the outlets of the canals.

For the week ending August 29 the maximum temperature was 100 and the minimum 41. There was a trace of precipitation.

The fourth annual beet tour through the Redwater and Belle Fourche Valleys was held on Monday. There were about 100 people traveling in 35 automobiles. This tour is sponsored by the Black Hills Sugar Plant and is to give beet growers and others interested in this important agricultural industry an opportunity to see at first hand just what is being done by different methods of planting, irrigation, and cultivation.

The beet crop as a whole for the district at this time is average. If water can be provided for another irrigation, the beets will come through in good condition. This additional irrigation may be made available by blasting out some of the concrete structure in front of the outlets to the canals.

The water was out of the North canal on the 26th, but all crops were irrigated just prior to that date.

The work during the week was finishing all irrigation, plowing in fields A and P, leveling land in field P, and digging drainage ditches in field O.

Beyer Aune.

Prosser

The maximum temperature for the week ending August 22 was 95.5° and the minimum was 48.5. The greatest daily range was 43.

Irrigation water deliveries to the station have been cut to 75 per cent of the normal August delivery.

Head lettuce seed was threshed as an experiment to determine if it would be feasible to produce that seed in this section. The yield of seed is estimated at 350 pounds per acre. Last year lettuce seed was shipped to the station from Colorado at a cost of $1.36 a pound.

Prosser (cont'd)

Other farm work consisted of hoeing potatoes and taking soil samples for moisture. The rapid weed growth in the potato plots will probably give rise to errors in determination of water requirements of potatoes.

During the week ending August 29, the maximum temperature was 95° and the minimum 46. The greatest daily range was 41.

The Kittitas tunnel that carries irrigation water under the Yakima River near Ellensburg broke, and the water-users of the new project probably will not receive any more water this season. The water deliveries at this station, however, have not been increased even with the supplemental water of the Kittitas project.

Work for the past week involved soil moisture sampling, cultivation of potatoes, and hauling manure. Color picking of Jonathan apples will begin at the station next week. The first lot will probably be sold for about 60 cents a box. The lots are being pooled, so the actual price is not known.

Anjou pears are bringing $40 per ton for the extra fancy and $20 a ton for fancy. The Winter Nellis are bringing $20 per ton to the grower for extra fancy and $10 per ton for fancy. Growers are receiving 3 cents a pound for Kentucky Wonder beans. These beans have been shipped from the Coast into the Yakima Valley by trucks, which reduced the price to valley growers. Some onion growers of the valley have been under contract to raise onions for $10 per ton. The price of hay still remains at $8 to $9 per ton, butterfat at 28 cents per pound, and combination grade potatoes at $12 a ton.

The specific conductance of irrigation water from the Sunnyside Canal was as follows:

Date	$K \times 10^{-5}$
Aug. 20	11.9
" 29	12.3

Carl A. Larson.

San Antonio

Temperatures during the two weeks ending August 29 have continued slightly below normal with a maximum of 96° for the period. Partly cloudy weather has prevailed with small, ineffectual showers on two days. Second growth sorghums have ceased developing and late-planted grain sorghums are showing some distress from lack of moisture. Cotton on the station and in the immediate vicinity has continued to decline due to the rapid spread of the rootrot disease and the continued attack of boll weevils on the nearly mature bolls.

Corn husking was started during the last week and will be finished by the middle of next week. While final computation cannot be made until representative samples have been "crib-dried", indications are that the yields will be appreciably lower than had been expected although still above the 24-year average for the station. A summary of the climatological data recorded for the period is shown below.

San Antonio (cont'd)

Week ending	Temperature						Precipitation	Aspect of the sky		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean						
							In.	Days	Days	Days
Aug. 22	96	93.3	63	68.0	80.6	28	.27	4	2	1
" 29	96	93.7	67	69.9	81.8	25	.11	2	5	0

Official visitors were Messrs. Hunter and Black, August 17, and Mr. Paul R. Dawson, August 29—all of the Bureau of Chemistry and Soils.

Geo. T. Ratliffe

Scotts Bluff

The average maximum temperature for the week ending August 22 was 91°, with a maximum of 95 on the 22d; the average minimum was 56, with a minimum of 52 on the mornings of the 20th and 21st. No rain fell during the week. The total evaporation was 1.872 inches. The average wind movement was 4.4 miles per hour.

Water has been run continuously during the week. The potato and beet plots have been irrigated again. The new seeding of sweet clover and alfalfa on the Walker tract has been watered and is now doing well.

The sheep feeding corrals are being cleaned out this week in preparation for another wheat feeding test. The rations will be the same as last year. The sheep will be put in at once so that the test will not interfere with the usual winter-feeding program.

The annual potato tour was held Wednesday of this week. It was very well attended. Lunch was served at the station and the entire afternoon was spent in going over the work that is being done by the station and Mr. H. O. Werner, Associate Horticulturist of the College of Agriculture at Lincoln. The potato crop in the valley appears to be very good. If the normal amount of rainfall is received in September, the shortage of water will not seriously affect the potato crop.

The Great Western Sugar Company has announced a price of $12 a ton bulk for its 1931 dry pulp output, which will contain 25 per cent of discard molasses. This is about $2.00 above the price of barley at this time.

At a meeting of the water-users of the Pathfinder district, held at Mitchell during the week, it was decided that the heads should be decreased to the point where there would be sufficient water for at least one irrigation for potatoes about the 10th of September. On the Fort Laramie district (South Side) the plan is to close the headgates to the Fort Laramie Canal for one week beginning September 1 and then furnish the balance of the water.

On August 20 the headgates of the Gering Canal were closed. They are now pumping water from a drain ditch to supply some of the farms. At the end of the week the storage in the Pathfinder was 49,020 acre-feet and at Guernsey 50,580 acre-feet. The Pathfinder inflow is 135 second-feet and the outflow is 2,850 second-feet.

Scotts Bluff (cont'd)

Mr. Scofield and Mr. Hastings spent the first part of the week at the station.

The average maximum temperature for the week ending August 29 was 87°, with a maximum of 95 on the 26th; the average minimum was 49, with a minimum of 40 on the morning of the 29th. There was no rainfall during the week. The total evaporation was 1.819 inches. The average wind movement was 6.0 miles per hour.

The total precipitation for the month of August has been 0.36 of an inch, as compared with 5.70 inches last year and a 22-year average of 1.74 inches. For the growing season to date it has been 3.42 inches, as compared with 14.14 inches last year and a 22-year average of 10.46 inches. The total precipitation for the year to date has been 4.20 inches.

The storage in the Pathfinder reservoir at the close of the week was 17,020 acre-feet and at Guernsey 39,340 acre-feet. Water-users under the Pathfinder district have been notified that the gates at the Pathfinder reservoir will be closed September 1 and water will be turned out of the Interstate Canal on the 3d. It will take two or three days to lower the canal so that some water will be available until about the 10th.

Crops are in very good condition so far as moisture is concerned, and with the normal amount of rain they should go through to maturity without any great loss.

All the potato and beet plots on the station proper and the Walker tract have been watered during the week. The winter wheat plot (Rotation 5) was irrigated and plowed, and the alfalfa plots in rotations 44, 48, and 65 were seeded and irrigated. The rye plot in rotation 27 was also seeded.

The Superintendent was at the Denver market the first of the week and bought a carload of lambs for the summer feeding test in which wheat is the basic ration. The lambs were a choice lot and averaged about 67 pounds.

Quite a successful bean tour was conducted by the County Agent during the week. Preparations are being made for an extensive harvest this year and for an increased business in the bean industry in the valley. The storage capacity of the warehouse at Morrill has been enlarged, and a warehouse and sorting plant has been built at Gering. This new plant has about the same capacity as the one at Morrill, both of them being owned and operated by Chester B. Brown.

There has been little change in the price of farm products. Fed steers have made a considerable increase in price in the past month.

James A. Holden.

Yuma

The maximum temperature for the three-week period ending August 22 was 113, minimum 66, and the greatest daily range 39. The precipitation was .92 inch. With the exception of a few days following the rainy period of August 3 to 7, the temperatures and humidities have been abnormally high. For a while it seemed as though the summer might be over, but the maximum temperature of 113 on the 19th proved that it

Yuma (cont'd)

was not.

Reports from all sections of the project indicate that the severe shedding for the past six weeks will materially reduce the yield of cotton this year. The August 1 condition of cotton in this area was reported to be 92. The present condition will probably be as low as 72. Ginning has commenced but only a few pickers are in the fields. Finance companies are advancing 60 cents per hundredweight for picking and hauling. Cotton seed prices at the gins have not been established, although the reports have it that the price of seed will just about cover the ginning costs. The local lint market is stagnant; very little if any sales are being made.

The general storms over northern Arizona have contributed sufficient water to the Colorado River to relieve the water shortage in the Imperial Valley. The Gila River contributed some of this flow, but most of it came out of the Bill Williams and Little Colorado Rivers. At present the river is dropping rapidly and a further shortage may develop.

Station work performed during the period has included the cultivation of grain sorghums, harvesting alfalfa, planting bean varieties, cultivating orchards, and cleaning and repairing ditches.

The maximum temperature for the week ending August 29 was 113, minimum 70, and greatest daily range 38. The precipitation was .58 inch. The high temperatures, especially at night, and the high humidity have combined to make the weather very uncomfortable and also unfavorable to the cotton crop. The shedding of squares and small bolls has continued during this period of humid weather. The rain on the 29th was spotted and only covered a small territory.

Alfalfa seed prices are nominal being around 9 to 10 cents, and the market is very dull. Cotton ginning as reported from nine gins which are operating on the project show only 622 bales turned out as compared to 1,230 for this date in 1930.

Following the flash flood in the Colorado River, the stream has decreased in flow to the low point of 684 cubic feet, as reported on August 28. This means that the Imperial Valley is again on a water pro-rating basis. The water requirements for the Yuma project are adequately handled so far.

Station work performed during the week has included the hauling of brush and date leaves, trimming lawns and ornamentals around the buildings, cutting grass in ditches, roguing alfalfa and cotton plots of sandburs, roguing grain sorghum plots, bagging plants in the grain sorghum nursery, and general irrigating, hoeing, and cultivating.

E. G. Noble.

W E E K L Y R E P O R T S

Of The Division Of

WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

Vol. XXXIII September 5 and 12, 1931 No. 17

Belle Fourche

The maximum temperature for the week ending September 5 was 100 and the minimum 50. The precipitation was .04 inch.

Some more irrigation water was available during the week, and a considerable proportion of the beets were irrigated. The last irrigation may pull the beets through in fairly good condition if the continuous hot weather that has prevailed so far in September abates. All the beets in field A were irrigated.

Winter wheat was planted in the irrigated rotations and M-P. Other work consisted of plowing in field A, hauling manure, fencing, and tile drainage in field O.

Leo Stuhr, representative of the Federal Farm Board, has been on the project during the week for the purpose of organizing the beet growers in this territory.

Beyer Aune.

Huntley

The maximum temperature recorded during the two-week period ending September 5 was 96 and the minimum 42. The precipitation was .04 inch. Weather conditions continued hot and dry during this period, and irrigation requirements of crops were high. The supply of water in the canal has been adequate since the completion of the temporary diversion dam in the Yellowstone River at the canal intake. Sugar beets and other late crops are making good growth where fully irrigated and indicate that fairly good yields will be obtained.

The harvest of Great Northern beans is well under way. Buyers are holding off and are making no definite offers for this crop, which is being stored in bean elevators and on farms. Sweet corn is being delivered at the Billings canning factory at $10 per ton. Yields of 4 to 5 tons are reported.

At the station the harvest of beans and the threshing of grains was completed. Yields of grains are exceptionally low due to hot weather and hail damage.

Yields of grains in the irrigated rotations and in variety tests are given in the following tables.

Huntley (cont'd)

Yields of oats in the irrigated rotation experiments in 1931

Rotation No.	Plot No.	Yields: Pounds per plot: Grain	Yields: Pounds per plot: Straw	Yields: Bushels per acre, grain	Ratio of grain to straw, pounds
1	K- V- 21	291	409	36.4	1 : 1.405
16	- 1	344	436	43.0	1 : 1.267
22	- 8	523	507	65.4	1 : 0.969
23	- 16	514	576	64.2	1 : 1.121
24	- 9	260	690	32.5	1 : 2.654
25	- IV- 6	448	672	56.0	1 : 1.500
27	- V- 20	460	640	57.5	1 : 1.391
28	- 17	450*	710	56.2	1 : 1.578
30	- IV- 15	330	370	41.2	1 : 1.121
31	- III- 13	332	418	41.5	1 : 1.259
32	- IV- 18	264	256	33.0	1 : 0.970
42	- 10	665	825	83.1	1 : 1.241
44	- 11	665	815	83.1	1 : 1.226
60	- III- 10	654	826	81.7	1 : 1.263
61	- 4	445	1,075	55.6	1 : 2.416
1-a	L- IV- 1	442	808	55.2	1 : 1.828
34	- 2	423	577	52.9	1 : 1.364
35	- 6	267	393	33.4	1 : 1.472
46	- 13	438	682	54.7	1 : 1.557
64	- 18	352	538	44.0	1 : 1.528
69	- 25	468	702	58.5	1 : 1.500
Average	---	430	615	53.8	1 : 1.459

*Green

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Yields of wheat in the irrigated rotation experiments in 1931

Rotation No.	Plot No.	Yields: Pounds per plot: Grain	Yields: Pounds per plot: Straw	Yields: Bushels, per acre, grain	Ratio of grain to straw, pounds
3	K- V- 23	269	501	17.9	1 : 1.862
18	- 4	343	547	22.9	1 : 1.595
28	- 18	322	718	21.5	1 : 2.230
37	L- I- 1	360	440	24.0	1 : 1.222
47	- 12	232	618	15.5	1 : 2.664
49	- 8	344	686	22.9	1 : 1.994
Average	---	312	585	20.8	1 : 1.928

Huntley (cont'd)

Yields of wheat in variety test, Field L-II, 1931

(Size of plots .0375 acre)

Average of:	Variety	Bushels per acre
3 plots	Supreme	43.1
3 "	Reward	30.8
3 "	Federation	59.0
3 "	Marquis	48.4
3 "	Ceres	48.0
3 "	Hope	55.7
3 "	Reliance	57.3
3 "	Marquillo	50.8
3 "	Marq.x Fed. 666	56.6
4 "	Pringle Champlain	59.6
3 "	Kubanka	62.0
3 "	Nodak	62.8
3 "	Mindum	54.1

Dan Hansen.

Newlands

Note: This report was not received in time to include it in the previous issue.

The average maximum temperature for the two-week period ending August 29 was 95, with a maximum of 100 on the 24th and 25th; the average minimum was 51, with a minimum of 42 on the 27th. The mean temperature was 73. The average hourly wind movement was 1.7 miles. There was no precipitation during this period.

The field work has been more or less retarded because of the unusually dry season. Haying and threshing are completed. The usual fall work has started: that is, the tractor and scraper are again being used in leveling new land, and machinery is being repaired and stored. Cement floors have been laid in the garages; and new corrals, calf sheds, and a machine shed have been built for the use of the State in the dairy investigations.

Most of the farmers throughout the project succeeded in obtaining two crops of alfalfa in spite of the water shortage. Cantaloupes are very few, and the mature melons on hand are being used entirely for local consumption.

The orchard has suffered considerably from lack of water this season. The apples and pears are small and many are rotting on the trees before maturing. The remaining fruit, such as plums, apricots, and peaches, is practically negligible.

The laboratory work has been increasing during this dry period, and some very valuable information is being accumulated with respect to the underground waters throughout the project.

The yields of wheat and barley on the station are given in the following table.

Newlands (cont'd)

Yields of Grain, 1931

Plot	Grain	Area	Straw and grain, yields per acre	Grain yields per acre
		Acres	Pounds	Pounds
B	Wheat	2.61	1,255	475
D-3	Barley	.76	2,816	1,414
D-6	Barley	.76	3,513	1,934
E-5	Barley	.76	1,671	737
F-4	Barley	.52	2,635	1,231
F-5	Wheat	.52	2,788	1,327
J-1	Wheat (Little Club)	.49	4,265	2,041
J-2	Wheat (Jenkins Club)	.49	4,122	2,143
J-3	Wheat (Spring Federation)	.49	2,847	1,327
J-4	Wheat (Early Baart)	.49	2,806	1,214
Y-19	Barley	.45	200	71
Y-20	Barley	.45	111	82
Y-21	Barley	.45	67	24
Y-22	Barley	.45	67	27
Y-23	Barley	.45	0	0

E. W. Knight

Prosser

Report for week ending September 5

The water-users of the lower Yakima Valley have been promised another reduction in water deliveries, which is to become effective in a few days. There are about 89,000 acre-feet of available irrigation water remaining in the storage reservoirs, according to the latest report. The station has been receiving but a little less than normal September deliveries. This has been possible because of extra water from the Kittitas district due to the break in the siphon under the Yakima River.

Soil sampling and potato cultivation were the principal activities during the week. The three orchard plots receiving monthly application of water will be irrigated for the last time next week. Plots receiving irrigations every 15 days will be irrigated once more the latter part of this month.

Grape production this year is thought to be larger than last year. The growers are receiving 11 to 12½ cents a basket for Concord grapes. Quotations on board cars are mostly 15 cents a basket. Some cash buyers are paying $1.00 per box for fancy grade Jonathan apples delivered before September 10. The soft fruit season is on the wane, as Bartlett pears, Italian prunes, and virtually all peaches are off the trees. The mixed fruit loadings dropped to 186 cars last week, 241 cars being forwarded the previous week.

The water deliveries at the station have been normal for the week ending September 12. There were 65,899 acre-feet of storage water in the reservoirs and it is being used at the rate of approximately 3,300 acre-feet a day.

The Washington State Fair will be held in Yakima from September 14 to 19. A very complete livestock and farm produce exhibit is being

Prosser (cont'd)

planned.

All of the past week was required for soil moisture work on orchard plots. At the station the Jonathan apples have all been picked in order to keep them out of the winter apple pools. The third cutting of alfalfa will be under way the first of next week. The hay would grow much more and give greater weight, but the danger of bad weather necessitates cutting early.

The carload lot shipments of produce from the Yakima Valley for this season compared with 1930 follow.

	1930	1931
Apples	382	294
Grapes	18	31
Mixed fruit	1,427	885
Pears	1,266	1,231
Peaches	364	797
Prunes and plums	393	169
Melons	376	229
Onions	41	33
Potatoes	1,333	1,200
Tomatoes	312	219
Vegetables	34	20
Other crops	552	393
Total	6,498	5,501

Unsettled weather conditions prevailed during the past week. The maximum temperature was 76° F. and the minimum 40.5.

The specific conductance of water samples from the Sunnyside Canal:

Date	$K \times 10^{-5}$
Sept. 3	14.5
" 11	15.7

Carl A. Larson

San Antonio

Report for the two-week period ending September 12.

The past month was the coolest August for which records have been kept at this station. The maximum temperature, 97, was 1° lower than recorded for August since 1907 and the mean was 0.1° below the previous minimum mean temperature. Although cloudy and partly cloudy days were common throughout the month, only .43 inch of rain was recorded.

Temperatures have been slightly higher during the first two weeks of September, although no uncomfortably hot weather has occurred. No rain has fallen this month to date and all cropped fields are extremely dry. Practically no growth has been made by either grain or hay sorghums.

Corn harvest was completed September 3, and cotton picking started September 8. All rotation cotton plots have been picked, the average yield being at the rate of 198 pounds of seed cotton per acre.

Messrs. Dawson and Nelson of the Bureau of Chemistry and Soils were at the station on September 10, giving the land in their deep-

San Antonio (cont'd)

tillage experiment on field C-6 its first subsoiling. The Killefer subsoil tool was run to an average depth of 20 inches under the rows of this season's cotton crop. Weather permitting, the same tool will be run under the middles and the soil further stirred with the Killefer chisel to a depth of about 11 inches, about ten days or two weeks later. Similar treatment last fall, although given later in the year, appears to have been responsible for an appreciable decrease in rootrot infestation this season. Similar treatment is being applied in plots C-6 - 12 to 17 in an experiment testing the effect of deep subsoiling after cotton, sorghum, and fallow.

The following is a summary of the meteorological data recorded for the period of this report.

Week ending	Temperature						Precipitation	Aspect of the sky		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean						
							Inches	Days	Days	Days
Month of August	97	93.9	59	69.4	81.6	35	.43	17	12	2
Sept. 5	98	96.4	69	72.7	84.6	28	---	4	3	0
" 12	96	95.6	58	67.9	81.7	32	---	4	3	0

Geo. T. Ratliffe.

Scotts Bluff

The average maximum temperature for the week ending September 5 was 87°, with a maximum of 99 on the 5th; the average minimum was 54, with a minimum of 47 on the morning of the 3d. The precipitation amounted to 0.25 inch, making a total to date for the growing season of 3.67 inches. The total evaporation was 1.333 inches. The average wind movement was 4.2 miles per hour.

The total precipitation for August was 0.36 inch as compared with 5.70 inches last year and a 22-year average of 1.74 inches. The total for the growing season to September 1 was 3.42 inches as compared with 14.14 inches last year and a 22-year average of 10.46 inches.

The water supply in the Pathfinder reservoir did not hold out as long as was hoped, and the gates at Pathfinder were closed for the season on September 1. Water was turned out of the main canal on the 2d, and the water was out of the lateral systems on the 4th. By using a day and night irrigator it has been possible to keep the cultivated crops on the rotations well watered. All of the corn, beets, and potato plots were thoroughly watered last week as well as the fall-seeded plots of alfalfa and wheat.

Corn harvesting began on September 2, and two of the silos have been filled.

Thirteen lots of lambs were started on feed for the second year of the wheat-feeding test. The indications are that a greater amount of wheat will be used this year in feeding throughout the Panhandle district than was used last year.

All of the towns of the valley as far east as Bridgeport are now supplied with natural gas from the Wyoming fields, the old Sinclair pipe-line being utilized for this purpose.

Scotts Bluff (cont'd)

The Sugar Company and the beet growers have agreed on a method of tare-taking for the fall campaign, and some of the dissatisfaction that has always resulted from this operation will be eliminated. Only brushes will be used in cleaning the beets after they have been received by the company. Haulers will also be paid on the basis of the net weight rather than the gross.

The average yield of the second cutting of alfalfa was 1.40 tons per acre.

The average maximum temperature for the week ending September 12 was 94°, with a maximum of 99 on the 9th and 10th. This average was only 1° below the high week in July and was the hottest week ever recorded in September during the past 22 years. The average minimum was 56°, with a minimum of 49 on the morning of the 12th. The minimum was considerably above the normal for this season. There was no rainfall during the week. The total evaporation was 1.823 inches. The wind movement for the week was 4.4 miles per hour.

During the week the filling of the siloes was completed.

The third cutting of alfalfa was put in the shock during the week. The yield is very light because water was not available for irrigation and there was no rainfall during the time when it would have been beneficial.

Water was available for irrigation in the Fort Laramie canal (South Side) about a week longer than it was in the Interstate canal. Some of the other canals in the valley are still running practically full heads. The Farmers canal is maintaining almost its summer head, and the Mitchell ditch is still distributing water. Under the Interstate canal (Pathfinder district) beets and potatoes are beginning to suffer.

Four lots of eight steers each have been put in the feed yards and are being fed the following rations:

Lot 1 - Wheat and corn
Lot 2 - Wheat, corn, and barley
Lot 3 - Wheat and barley
Lot 4 - Wheat and pulp

In addition to the rations just enumerated, each lot receives alfalfa, corn silage, and cottonseed cake. These steers are two years old and were run on grass the past summer and weighed in to the feedlots an average of about 960 pounds.

There has been little change in the price of farm products. Butterfat is up one cent and eggs have lost about the same.

James A. Holden.

Yuma

The maximum temperature for the two-week period ending September 12 was 109, minimum 49, and the greatest daily range 51. The precipitation was .50 inch. With the exception of a few nights with minimum temperatures as high as 70, the weather has moderated to the extent that it feels more like fall and less like summer. The precipitation

Yuma (cont'd)

for the period was recorded in three thunder showers. Heavier rains were reported in the Imperial Valley to the west and in the Wellton and Mohawk Valleys to the east.

The flow of the Colorado River at Yuma has established a low record. On September 12 the stream was gauged at less than 300 second-feet. This means that there is little more than sufficient water being diverted to the Imperial Valley to take care of its domestic needs and for watering livestock. The up-river reports are not encouraging as far as any increase in flow is concerned.

This water shortage in the Imperial Valley has seriously interfered with the alfalfa seed market on the Yuma project. The time of planting is now at hand, but the water and financial conditions have tied up any planting program.

Lettuce is being planted in the Yuma Valley and on the Bard sections of the project, as sufficient water is available to take care of all crop needs.

Cotton picking and ginning is unusually slow this year. For the period ending September 10 1,220 bales have been ginned. The picking price of 50¢ per hundred has not interested pickers to the extent that there is any surplus of pickers available.

An epidemic of Kansas-Nebraska horse plague, also called pasture poisoning, forage poisoning, botulism, and encephalitis, has broken out on the project. About a hundred horses and mules have died in the Yuma Valley. Reports are also coming in from the Gila Valley sections. The State of Arizona has granted an emergency appropriation of $1,000 and placed a veterinarian in charge of the control work. In 1930 about 3,000 horses died in the San Joaquin Valley of California of this disease.

The plant quarantine situation in Arizona is still being discussed with the Governor and agricultural interests. The latter are asking for the opening and operating of thirteen stations, but the Governor says there will be five stations or none. All stations are closed now with the exception of the two which are inspecting traffic from the Salt River Valley westward.

The Yuma County Board of Supervisors changed their budget under pressure of the Yuma County Farm Bureau and included the necessary expenses to maintain the County Agriculturalists office for another year.

Station work performed during the past two weeks has included the plowing and leveling of B-21 and 22, disking all fallow plots, hauling and sawing wood, roguing grain sorghums, hoeing borders for sand-burs, and general irrigating and cultivating.

E. G. Noble.

W E E K L Y R E P O R T S

Of The Division Of

WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

Vol. XXXIII September 19 and 26, 1931 No. 18

Huntley

The maximum temperature for the two weeks ending September 19 was 96 and the minimum 37. The precipitation was .11 inch. Weather conditions were favorable during this period.

The harvest of beans and the third cutting of alfalfa are well under way on the project. Yields of beans are reported to be slightly less than the average of former seasons. The price of Great Northerns has dropped to $1.00 to $1.50 per hundredweight. Garden seed beans, of which there was but a small acreage on the project, are being delivered at the contract price of $5.00 per hundredweight.

Late-season conditions are favorable for the growth of sugar beets. The harvest is to begin on September 22. An average yield of 12 tons per acre on the total Billings factory district area of 31,000 acres is the pre-harvest estimate.

On the station the harvest of beans and the filling of silos was completed. Corn for silage was well matured for this purpose, and a total of 150 tons was harvested.

Station visitors were Prof. Louis Vinke and Mr. J. H. Dickson of the Montana Experiment Station.

The total rainfall during the week ending September 26 amounted to .73 inch. The maximum temperature was 73 and the minimum 30. A light frost on September 22 damaged only slightly the more tender garden crops. The rainfall was one of the heaviest of the year and amounted to more than the rainfall in any month since October 1930. The total rainfall since January 1 has been only 4.8 inches as compared to an average of 11.37 inches for the first nine months.

Rain delayed the beginning of the beet harvest, and no beets were delivered at local stations until September 25. The sugar content at the beginning of the harvest season is reported to be unusually high.

Station work during the week included harvest of the third cutting of alfalfa and plowing and manuring stubble lands.

Dan Hansen.

Newlands

The average maximum temperature for the four-week period ending September 26 was 78.5, with a maximum of 96 on September 3; the average minimum was 43.1, with a minimum of 28 on September 11. The mean temperature was 60.8. The average hourly wind movement was 2.7 miles.

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Newlands (cont'd)

The precipitation was 1.075 inches.

At the station the rotation plots are being given the usual fall treatments. Manure is being applied to plots D-1, E-3, and F-1. Gypsum is being applied to those plots in the rotations requiring gypsum treatments.

One man with the tractor is preparing some seven acres of sagebrush land south of the B series for a reclamation experiment. The tractor, which was obtained last year, has made it possible to relevel large areas on the station, and it is planned to bring these new areas under cultivation. It would have been almost impossible to do this work with our former methods of horse-drawn scrapers as the time required for such a task would have made it impractical.

Some sections of the project show the lack of irrigation water. The stands of alfalfa are parched and some permanent injury may result. However, the lower-lying areas seem to have come through the drought in fair condition. Very little of the third crop of hay was harvested, but for the most part it made very good pasture.

During the middle of the summer a number of buyers were purchasing hay for winter feed for cattle. Some hay, to be fed to beef stock, sold for as much as $10 a ton, but there has been a decided decrease in these sales. Unless other purchases are made this fall, a surplus of hay will probably be carried over until the 1932 season. Evidently the low price being paid for finished beef has been an important factor in the small demand for hay.

The present shortage of water has caused an increased interest in the drilling of wells. As a result the laboratory has received a great number of water samples to be analyzed. Much valuable data is being gathered on the character of the underground water over a large area of the project.

E. W. Knight.

Prosser

The third cutting of alfalfa was made the first part of the week ending September 19. Owing to inclement weather the hay cured slowly and stacking operations were delayed.

Water deliveries are still being made to the station, but the allotment is a little below normal. There were 48,163 acre-feet of water held in the storage reservoirs on September 19.

The locust seedlings which have made such rapid growth along the northwest ditch have been slashed for the third time this season. Plans are being made to cut out the large locust trees along this ditch during next winter.

The brood sows have farrowed and the fall litters are large and growing nicely. Nineteen hogs were sold recently for $4.90 and $5.40 per hundredweight. Hog prices are much lower than last year, but they have declined relatively less than feed prices.

Price quotations of farm produce: Hay, $8 to $9 a ton; potatoes, U. S. No. 1, $12 a ton; wheat, August delivery, 36 cents a bushel; hops, 15 to 16½ cents a pound; eggs, standard whites, cases included, 25 to 26 cents a dozen; and butterfat 29 cents a pound.

Prosser (cont'd)

The maximum temperature for the week was 79°, minimum 41.5, and the greatest daily range 36.5. There was .16 inch of rain on September 16.

Report for the week ending September 26

The water delivered to the station through the Prosser pump was shut off September 23 because the water was too low in the Sunnyside Canal to supply the pump. It is probable that more water will be delivered this season as soon as the checks in the Sunnyside Canal are adjusted to the smaller flow of water.

The final irrigation of the orchard plots was not completed because of water shortages. Plot 6, which receives approximately 7 acre-inches of water every 15 days, was the only plot that received the final irrigation.

All of the third cutting of alfalfa hay has been stacked. The cutting of corn for silage will begin next week. The Delicious apples have been picked, and the Rome Beauties are now being harvested. The price of apples is uncertain and will not be definitely known until some time during the winter.

Five large sections of metal flume located on field E-5 have been transferred to the north side of the orchard to be connected with the other large sections already installed there.

A small threshing machine has been constructed for the threshing of rod row samples of wheat varieties. This machine works very nicely, but a few minor improvements are being planned.

The supply of Bartlett pears in the valley is nearly exhausted. There was little activity in the shipment of apples from the Yakima Valley due to the heavy movement from the Wenatchee district. Shippers at Wenatchee were selling Jonathans from 5 to 10 cents under the price asked in the Yakima Valley. Wenatchee shipped 852 cars of apples last week and the Yakima Valley 238.

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the week ending September 19 was 83°, with a maximum of 92 on the 13th; the average minimum was 50, with a minimum of 40 on the morning of the 13th. The precipitation for the week was .06 inch and came in three showers. This is a total for the growing season of 3.73 inches. The total evaporation was 1.457 inches. The wind movement was 6.5 miles per hour.

The Scotts Bluff County Fair was held during the week. The attendance was not so good as it has been in the past; but the exhibits were very fine, with the exception of the fruit display. Fruit was a total failure this year in the valley. The livestock exhibits are growing in popularity and in number.

The Great Western Sugar Company has announced that their factories will not open until about the 5th of October, which is about ten days later than usual.

Potato digging has commenced in a small way. The yields are fairly satisfactory, but the quality of the early potatoes is not very good. A few of the late potatoes have been dug and show much better

Scotts Bluff (cont'd)

quality. The price for the best quality started at 50 cents a hundred, but it has declined to about 40 cents.

The third cutting of hay has been stacked. It was of high quality, but the yield was very poor. The yields from the three cuttings are given in the following table.

Summary of Yields of Alfalfa, Scotts Bluff Field Station, 1931

Series	Rotation	Plot	First cutting	Second cutting	Third cutting	Total
			Tons	Tons	Tons	Tons
I	65	8	---	---	.40	.40
		9	2.66	1.96	1.26	5.88
II	61	8	--	1.24	.54	1.78
		9	2.32	1.78	1.18	5.28
		10	2.72	1.80	1.36	5.88
	40	12	1.50	1.30	.80	3.60
		15	--	1.00	.50	1.50
III	60	8	--	.98	.36	1.34
		9	1.98	1.98	1.20	5.16
		10	2.06	1.68	.88	4.62
	42	12	1.06	1.16	.74	2.96
		15	--	1.16	.48	1.64
IV	62	8	--	1.12	.54	1.66
		9	1.54	1.88	.60	4.02
		10	2.14	1.90	.78	4.82
	44	12	1.70	1.50	.90	4.10
		15	.34	.70	.86	1.90
V	8	1	1.86	1.55	.66	4.07
	64	8	1.34	--	.64	1.98
		9	1.80	1.44	.56	3.80
		10	2.26	1.58	1.16	5.00
	48	12	1.70	1.58	1.00	4.28
		15	.68	.74	.78	2.20
O	71	15	--	--	.92	.92
		16	1.44	.94	.14	2.52
		17	2.30	1.50	.50	4.30
		18	2.30	1.46	.66	4.42
Average	--	--	1.33	1.25	.75	3.33

The average maximum temperature for the week ending September 26 was 68°, with a maximum of 78; the average minimum was 38, with a minimum of 33. The precipitation was .24 inch, making a total for the season of 3.97 inches. The total evaporation was 1.396 inches. The wind movement was 9.7 miles per hour.

On the morning of the 26th there was a slight frost, but the thermometer registered only 34°. It killed the tenderer plants, but did no harm to any crops. The week was unusually windy, and the moisture from the one rain did not do much good.

Potato digging is now under way all over the valley, and the yield is very good. Prices, however, are too low to make even the good yields profitable. The cash price to growers ranges from 35 cents

Scotts Bluff (cont'd)

to 40 cents a hundred. Most of the potatoes are being stored.

About 50,000 lambs have been shipped into the valley for feeding. The total will probably be about the same as last year. All feed will be cheaper this year. Hay is being quoted at from six to eight dollars a ton in the stack.

Some trouble has been experienced in keeping the lambs and steers that are on test from going off feed. The ration has had to be reduced several times, but they will probably eat better as the weather gets cooler.

Considerable time has been spent during the week in replacing and rebuilding some of the fences on the Walker tract.

James A. Holden

Umatilla

For the week ending September 19 the maximum temperature was 81° and the minimum 38. The precipitation was .09 inch.

The grading on the new station tract was continued during the week. For the present the land which will not be cropped in 1932 is being smoothed down and seeded to rye. The new tractor grader which is being used for leveling the land has proven to be very satisfactory.

The landscape and building arrangement plan submitted by Mr. F. A. Cuthbert, of the Landscape Architecture Department at Corvallis, has been received and the roads and buildings have been located on the building site.

Mr. D. E. Stephens, of the Division of Cereal Crops and Diseases, stationed at Moro, Oregon, and Mr. R. S. Besse, Acting Director, Oregon Experiment Station, visited the station during the week.

H. K. Dean.

Yuma

For the week ending September 19 the maximum temperature was 101, minimum 52, and the greatest daily range 46. The precipitation was .09 inch. One of those unusual weather conditions occurred on the 13th when a daily range of only 2° was recorded. This cloudy day followed the rain-storm and was preceded by a minimum temperature of 79° the previous night.

During the week the eleven gins on the project and in vicinity ginned 638 bales of cotton, making a total of 1,858 for the season. Last year on this date 5,440 bales had been ginned. The 638 bales include 70 from the Gila Valley and 1 from the roll gin in the Mohawk Valley. The first picking of cotton is light all over this section. The possibilities are favorable for a good top crop if weather and insect conditions are normal for the remainder of the growing season. Some salt marsh caterpillars are making their appearance.

Interest in livestock and in farm gardens is being stimulated by the low prices of alfalfa hay, alfalfa seed, cotton, and grains. Butterfat is quoted at 27 cents a pound and eggs at 32 cents a dozen. Local prices for hogs are about two cents under the Los Angeles market.

The water situation in the Colorado River has caused no worry as

Yuma (cont'd)

far as the Yuma project is concerned but continued to be pretty serious for the Imperial Valley district. The amount of water flowing in the river plus the water wasted back into the stream from this project has been sufficient for only a little irrigation after domestic and livestock needs have been provided for.

Station work performed during the week included the cleaning of ditches, installing ginning machinery, constructing the cotton storage building, repairing station guest house, repairing water and fire lines, and general irrigating and hoeing.

For the week ending September 26 the maximum temperature was 104, minimum 50, and the greatest daily range 46. The precipitation was .03 inch. Weather conditions in general have been very favorable for the harvesting of fall crops. The humidity readings have been higher than normal, and a few of the minimum temperatures were above 70.

Cotton picking and ginning continues to progress very slowly. The ginning report for the week shows 610 bales and for the season to date 2,468 bales. On this date in 1930 the total from all project gins was 6,992 bales. Cotton lint is selling at close to eastern spot prices. Cotton seed is still listed at $11 a ton at the gins.

During the early part of the week the flow of the Colorado River at Yuma was less than 100 second-feet. For the most part the Imperial Valley was getting all of its limited supply from the amount of water spilled into the stream from the waste spillway of the Yuma project. By the end of the week the river flow had increased, and up-river reports indicate that an adequate supply of water for the Imperial Valley is forthcoming.

One of the two remaining banks at Yuma closed its doors on September 21. While this concern did not do any great amount of commercial banking, it has tied up about $700,000 in deposits. As usual the station mess club and some personal funds were caught. The bank which failed last year is still in process of liquidation, but from present indications the depositors will recover practically nothing. This series of bank failures, which has included five project banks during the last six years, has, in conjunction with the low prices of cotton, hay, and alfalfa seed, resulted in a serious financial condition on the project. Arrangements are being made to request some kind of relief for charges due the Bureau of Reclamation.

Cotton picking was started on the Pima plots in the rotation test. This first picking is light as it represents very little of the middle crop. The station gin is being fitted with some new machinery for feeding, cleaning, and conveying the cotton. Other station work has included the pruning of date palms, cleaning ditches, repairing station electric power lines, and general irrigating and cultivating.

Dr. John H. Martin, of the Division of Cereal Crops and Diseases, inspected the station grain sorghum nursery on September 21. Messrs. Cook, Collins, Kempton, King, Pressly, and Eaton visited the station on September 22.

E. G. Noble.

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M I S C E L L A N E O U S

Mr. S. H. Hastings, Principal Agronomist, left Washington on October 3 for a trip to the Southwest. His itinerary includes San Antonio and El Paso, Texas; Phoenix, Tucson, and Sacaton, Arizona; and Bard and Riverside, California.

W E E K L Y R E P O R T S

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

Vol. XXXIII October 3, 10, and 17, 1931 No. 19

Belle Fourche

The maximum temperature for the week ending October 17 was 70 and the minimum was 27. The precipitation was .01 inch. The first killing frost occurred on October 13 when the temperature went down to 27°. This is the latest killing frost in the fall since records have been kept at this station. September also had the highest mean temperature on record to date. The total precipitation from January 1 to October was 7.08 inches; the average from 1908 to 1930 was 14.05 inches.

The harvesting of sugar beets was commenced on October 5, and the yields have been below the average. The harvesting of potatoes was completed during the week. The maximum yield, 216 bushels per acre, was obtained in rotation No. 21, and the minimum, 78.7, in rotation No. 20. The average was 144.3 bushels, which is 11.4 bushels above the average from 1912 to 1930.

On October 14 the lamb-feeding test was started. For this purpose 600 range lambs were bought and divided into six lots of 100 each. They are being fed the following rations:

Lot 1- Corn and alfalfa hay.
Lot 2- Barley and alfalfa screenings, mixed at the rate of 75 and 25 per cent, respectively; pressed beet pulp; and alfalfa hay.
Lot 3- Barley, pressed beet pulp, and alfalfa hay.
Lot 4- Oats, pressed beet pulp, and alfalfa hay.
Lot 5- Whole wheat, pressed beet pulp, and alfalfa hay.
Lot 6- Equal parts by weight of wheat and oats, pressed beet pulp, and alfalfa hay.

The lambs were all ear tagged. Individual weights taken at the beginning of the test showed an average of 59.3 pounds per lamb.

Beyer Aune.

Huntley

The maximum temperature recorded during the week ending October 3 was 85 and the minimum 36. There was no precipitation. Conditions were favorable for field work, and good progress was made on the beet harvest. Sugar beet receiving stations were opened for unlimited deliveries on October 1, and the local beet factory is slicing well over 3,000 tons daily.

At the station the beets in the fertilizer experiment were harvested, and a start was made in harvesting the rotation plots. The third cutting of alfalfa was hauled in. The average yield of the irrigated rotation experiments was 1.24 tons per acre. The yields in the variety test, Field O, were as follows:

Huntley (cont'd)

Average of:	Variety	Tons per acre
3 plots	Grimm	1.54
2 "	Ladak	1.45
2 "	Common	1.39
2 "	Cossack	1.31
2 "	Baltic	1.18

A shipment of 360 lambs for the cooperative lamb-feeding experiment was received. It is planned to continue the experiment as it was started in 1930 when 10 lots of 30 lambs each were fed. This year two more lots will be added.

Good feeder lambs are selling locally at $4.00 per hundredweight. There has been a heavy movement of lambs to corn-belt feed lots during the past month. This year as a general thing lambs are light in weight and in rather poor condition due to drouth and consequent short feed during the past season.

Local flour mills are having difficulty in obtaining sufficient milling wheat and are paying Minneapolis prices, which at present is 56 cents a bushel. Great Northern beans continue at the low price of $1.00 to $1.50 a hundredweight, and only a very small part of the crop has been moved. Alfalfa hay is selling at $8 to $10 a ton, the higher price being paid by Billings dairymen for hay within a hauling distance of 25 miles. Butterfat is selling at 26 cents a pound and eggs at 30 cents a dozen.

Mr. Louis Hurst, of the Bureau of Chemistry and Soils, visited the station during the week to supervise the harvest of sugar beets in the fertilizer experiment.

Dan Hansen.

Newlands

The average maximum temperature during the three-week period ending October 17 was 76, with a maximum of 85 on September 27; the average minimum was 34.2, with a minimum of 28 on October 12. The mean temperature was 55.1. The average hourly wind movement was 1.4 miles. There was .07 of an inch of precipitation.

The work of leveling land on the station has continued throughout this period. If some leveling is done each year, it will not be a great while before a large portion of the rough sage-brush land of this station will be under cultivation. The past year has marked an improvement in the cultivated fields and some waste land has been put under cultivation.

It was thought at first that a tractor of the type the station is using would be of little use in some of the sandy areas of the station. Heretofore the little work that had been done was accomplished with rented tractors of the track-laying type. However, the present tractor can do a great deal of work in this type of soil. It does not function as well as a track-layer but is much better than horse-drawn scrapers.

There is some improvement in agricultural conditions on the project. Butterfat and eggs have advanced a few cents. Turkeys have done fairly well and should bring a price of about 36 cents a pound on the holiday market. Some will be ready for the Thanksgiving market.

Newlands (cont'd)

There has been a slight increase in unemployment among the laboring classes of the project and some reductions in wages. However, the conditions in this small community are not so bad as those in the larger industrial centers.

The laboratory at the station is still receiving many water samples for analysis. Project farmers are trying to develop deeper wells than those they have been using. The dry fall has caused a depletion in the water supply of many wells. The town of Fallon is doing a great deal of well drilling in an attempt to locate at a depth of several hundred feet a supply of good water ample for the needs of its residents. As a result the chemist at the field station has been making a great many analyses of water samples, in an endeavor to help the local authorities and farmers to establish suitable sources of water for domestic purposes.

The boron and underground water investigations are being continued. A great deal of valuable data is being accumulated.

E. W. Knight.

Prosser

Report for week ending October 3

No irrigation water has been delivered to the station since September 23. Although on October 2 the Prosser pump was operating on a small head in order to fill some cisterns, there was not enough water to irrigate. On October 1 34,324 acre-feet of storage water was in the reservoirs. The release of this water amounts to approximately 200 acre-feet a day at the present time.

In the orchard soil samples were taken to the ten-foot level on the six plots, in the center of each plot. All of the plots were moist to the tenth foot except plot 4, which received 3½ acre-inches of water every fifteen days.

Corn cutting for silage began the middle of last week, and the silo is being filled quite rapidly. The harvest of Rome Beauty apples was finished the first of the week. The picking of Winesaps is expected to begin soon. A new foundation has been placed under the metal flume on the north side of the orchard. Flume repairs adjacent to the irrigation plots are in progress and will continue after the silo has been filled.

Weather conditions at the station during September: Seven days were clear, 16 were partly cloudy, and 7 were cloudy. The mean maximum temperature was 77.5, the mean minimum 47.7, and the mean 62.6. The evaporation was 4.186 inches. The wind velocity was 1.67 miles per hour. The precipitation was .17 inch.

A little less than two-thirds of the Jonathan apple crop in the Yakima Valley has been sold, leaving 600 to 700 cars on hand. The aggregate tonnage is placed at half that of 1930, or 1,950 cars. At the week-end the extra fancy grade of Jonathans was sold at $1.00 chiefly and the fancy grade at 80 to 85 cents a box. Delicious apples have been difficult to sell, but there has been some trading, and between 500 and 600 cars have been shipped.

Prosser (cont'd)

The shipment of produce from the Yakima Valley in carload lots this year as compared with last year:

	1930	1931
Apples	1,951	1,057
Grapes	102	82
Mixed fruits	1,612	1,025
Pears	2,441	2,099
Prunes and plums	438	189
Peaches	419	835
Melons	384	232
Onions	174	241
Potatoes	1,941	1,898
Vegetables	85	58
Other crops	864	612
Total	10,411	8,328

Specific conductance of water samples from the Sunnyside Canal:

Date	$K \times 10^{-5}$
Sept. 18	14.0
" 25	16.2
Oct. 1	16.9

The water level of the Sunnyside Canal was raised during the first part of the week ending October 10, and the Prosser pump has been operating on a small head. Enough water has been obtained to irrigate the cereal nursery for fall plowing and give plots 4 and 5 in the orchard a final irrigation. Recent rains in the mountains have augmented the depleted supply in the reservoirs. The acre-feet of storage water in the reservoirs on October 5 was 32,206 and on October 9, 31,899. The old earthen dam at the new Cle Elum dam site has been removed, and preparation for the construction of the new dam is in progress. The default in the Kittitas canal tunnel under the Yakima River near Ellensburg has not yet been analyzed.

One silo at the station has been filled with corn silage. Hay chopping was in progress the latter part of the week. The Winesap apple harvest has been progressing slowly and will be continued next week. A number of saline soil samples near Sunnyside and in an orchard near Yakima were taken for resistance determinations.

The maximum temperature for the first ten days of October was 84.5° F., which occurred on October 1, the minimum 32, and the greatest daily range 39.5. Killing frosts occurred at lower levels surrounding the station on October 4.. There was .31 inch of rain during the week.

Shippers have been selling extra fancy Jonathan apples for 85 cents a box and have not been able to move them very rapidly at this price. On the Chicago market Delicious apples from Virginia have been underselling Delicious apples from the Yakima Valley to the extent that producers in Yakima have been unable to sell their apples in Chicago, which has been a good market for them in the past.

Recent government figures on the potato crop show an increase of 14,000,000 bushels over recent estimates. This information has caused a slack market in the Yakima Valley. Virtually all the shipping this week has been on consignment, and many cars were forwarded

Prosser (cont'd)

with an advance of $100 a car. Cash offers to the growers at the week-end were mostly $10 a ton in sacks for No. 1 grade and $5 a ton for No. 2 grade sacked.

During most of the week ending October 17 the water in the Sunnyside Canal has amounted to approximately 450 cubic feet per second. The water delivery to the station has been cut off entirely for this season. The Bureau of Reclamation will begin preparations immediately to replace part of the old leaky pump line which carries water to the station with new continuous wood stave pipe.

Hay chopping and apple picking have been the main occupations at the station during the week. Most of the third cutting of alfalfa hay has been chopped to be used for the dairy cows. It is planned to feed the first and second cuttings to sheep which will be fed on contract. The potato and corn plots will be harvested next week.

Sixteen resistance determinations were made on saline soil samples. Moisture data taken on orchard irrigation plots is being calculated.

Hay is being sold for $5 a ton in the stack. U. S. No. 1 potatoes, sacked, are selling for $10.50 to $11.50 a ton. Potato shipments from Yakima have decreased greatly the past week. In some of the coast cities carloads were allowed to stand on the tracks four or five days because of lack of demand. The number of carloads of potatoes shipped at present is larger than the number shipped at this time last year. The growers are receiving 43 cents a bushel for wheat. Butterfat has advanced to 30 cents a pound and eggs to 27 cents a dozen.

The maximum temperature for the week was 73° and the minimum 29.5.

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the two-week period ending October 10 was 74°, with a maximum of 84; the average minimum was 44, with a minimum of 38. The precipitation amounted to 1.16 inches, all of it occurring since October 1. The average hourly wind movement was 5.2 miles.

The total precipitation for the growing season this year was 3.97 inches, as compared with 17.53 inches last year and a 22-year average of 12.19 inches. The temperatures (average), precipitation, and evaporation for the growing season during the last five years follow:

Year	Temperatures: Average maximum	Temperatures: Average minimum	Precipitation Inches	Evaporation Inches
1927	72	45	18.08	28.830
1928	74	44	9.26	32.815
1929	76	47	11.48	34.491
1930	77	42	17.53	29.197
1931	80	48	3.97	38.346
Average	76	45	12.06	32.735

Scotts Bluff (cont'd)

During the first half of the period covered by this report the labor at the station was cut to the winter quota, as all the field work has been completed with the exception of harvesting the potatoes and beets, which will be taken care of, as usual, through hired crews and contract labor.

The potato harvest has been completed. The quality of the potatoes was excellent, but the yield was poor partly because of poor stands. The stand in field K averaged only 64 per cent and in Field E only 59 per cent.

Leslie Bowen, assistant engineer, of the Division of Agricultural Engineering, spent about ten days at the station taking soil samples from each plot in field K. This is preparatory to initiating some soil moisture investigations at the Scotts Bluff Field Station.

Feeder lambs are coming into the valley in considerable numbers now. Alfalfa hay is selling at $6.00 a ton in the stack. With cheap grain and lambs at around 5 cents, feeders feel fairly safe.

The average maximum temperature for the week ending October 17 was 65°, the maximum 76, the average minimum 31, and the minimum 29. The precipitation was .15 inch. Through an error this amount was included in the last total, so that the total for the year remains at the figure given in the last report—5.91 inches. The average hourly wind movement was 5.1 miles.

The first frost of the fall season occurred on the morning of the 14th. This is the latest frost that has ever been recorded at the station, making a frost-free growing season of 147 days. In 1923, however, there were 150 days of frost-free weather.

During the week the experimental plots of potatoes on the Walker tract were harvested. Most of this work was conducted by Mr. Werner of the Nebraska Station.

The hogs that have been pastured on the Walker tract all summer were moved to the station. Farrowing will commence next week. Six sows that were bred very late were sold at a public sale. Twenty-two shoats averaging about 240 pounds each were sold at from $4.10 to $4.40 a hundred. The local price is about 75 cents under Omaha prices.

The prices of eggs and dairy products have advanced rather sharply in the last week. Eggs are 25 cents a dozen, and the cheese factory is paying 32 cents for sour cream. Considering the cost of feed, these prices return a very good profit. The dairy ration in use at the station (home-mixed) costs 73 cents a hundred, and the feed cost of butterfat and whole milk is 18 cents and 61 cents as compared with 21 cents and 73 cents last year.

The beet harvest indicates a yield below normal but a high sugar content. This year the grower will be paid according to tests of individual fields rather than the average for the valley. The test on some fields has run as high as 18 per cent sugar.

Scotts Bluff (cont'd)

Summary of Yields of Potatoes, Scotts Bluff Field Station, 1931

Rotation	Pounds per plot	Bushels per acre	Per cent stand
		Field K	
4	690	46.0	65
27	2,550	170.0	58
25	3,710	247.3	55
21	3,030	202.0	65
26	880	58.7	66
31	4,160	277.3	82
61	3,810	254.0	62
30	2,710	180.7	64
60	3,790	252.7	67
40	5,050	337.3	66
20	1,700	113.3	75
44	3,900	260.0	52
24	1,680	112.0	60
64	5,120	341.3	67
71	3,250	217.3	55
Average:	3,069	204.6	64
Untreated plots		102.1	
Manured plots		242.2	
Alfalfa plots		277.1	
		Field E	
49	4,970	331.3	63
41	5,600	373.3	65
46	4,550	303.3	76
17	4,130	275.3	50
43	5,200	347.3	64
33	4,530	302.0	44
47	4,670	311.3	50
Average	4,803	320.5	59

James A. Holden.

Yuma

The maximum temperature for the week ending October 3 was 104, minimum 59, and greatest daily range 41. The precipitation was .30 inch. The records of the Weather Bureau station at Yuma, averaging them for a 61-year period, show the month of September to be 0.1° below normal in mean temperature and .39 inch above normal in precipitation. The station also reports that the discharge of the Colorado River for September totaled 72,800 acre-feet. This is a new low record. The 29-year average for the month is 725,800 acre-feet.

Cotton picking and ginning on the project continues to be slow. During the week 394 bales had been turned out. The total to date is 2,862 bales. Buyers are complaining about the grade of the early picked cotton; the prices being paid are nearly a cent a pound under eastern spot quotations.

Yuma (cont'd)

Station work during the week included the manuring of citrus orchards, A-9 and A-12-4; pruning and hauling date palm leaves; constructing a cotton storage house; extending and repairing station water and fire lines; picking cotton; general irrigating and cultivating.

Mr. T. H. Kearney visited the station on October 1 and 2. Mr. J. S. Townsend, of the Division of Cotton, Rubber, and Other Tropical Plants, left for Shafter, California, on October 1. He will return about the 15th to complete the installation of the new cotton ginning machinery.

The maximum temperature for the two-week period ending October 17 was 98, the minimum 42 and the greatest daily range 46. The precipitation was .01 inch. The light shower on the 15th did not interfere with any field work. All other days for the period were clear. Prevailing west and northwest winds have lowered the humidity readings. This dry clear weather has hastened the maturity of all the fall crops.

Six Indian pickers have covered about a third of the cotton plots on the rotations. The yields this year are lighter than usual, but some of the better rotations are turning out more than a half a bale per acre for the first picking. The top crop is developing nicely and should produce another yield of half a bale.

Corn and grain sorghum crops are mature, and the harvesting of these plots has commenced. There has been an unusual amount of "blasting" of the heads of grain sorghums this past season. Bird injury has also been more severe than normal.

The ginning report on the project shows a total of 3,849 bales turned out for the period ending October 15. The total for this date in 1930 was 11,522 bales. It is quite evident that cotton yields on the project will be unusually low this year.

The early plantings of winter lettuce are being damaged by grasshoppers and salt marsh caterpillars. Lettuce growers are busy with poison mashes and sprays to check these insects.

Some alfalfa seed is being sold at six to seven cents. There is very little demand for hay at any price. Beef cattle shipments have been arriving during the month to be fattened locally for the coast markets.

Station work performed during the two-week period has included the picking of cotton, building a cotton seed storage house, repairing the cotton ginning plant, extending the station water and fire lines, planting sugar beet seed nursery plot, plowing and releveling nursery and garden plots, harvesting alfalfa on plots B-9 to 17, and general irrigating and cultivating.

Messrs. W. W. McLaughlin, H. F. Blaney, C. A. Taylor, and J. H. McCormick, of the Division of Irrigation, Bureau of Agricultural Engineering, were station visitors October 12. B. A. Harrigan, Horticultural Commissioner of Imperial County, called at the station on the 15th.

E. G. Noble.

W E E K L Y R E P O R T S

Of The Division Of
WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

Vol. XXXIII October 24 and 31, 1931 No. 20

Huntley

For the two-week period ending October 24 the maximum temperature was 76 and the minimum 22. There was a trace of precipitation. Favorable weather prevailed during this period, and excellent progress was made in the beet harvest and other field work.

The harvest of beets in the valley was reported to be about 75 per cent completed. Yields are said to average about 12 tons per acre over the entire district, in which there is a total of nearly 30,000 acres. Included in this is an area of 4,500 acres on the Billings bench which was damaged by hail and on which the yield is averaging about 9 tons per acre. It is reported also that the sugar content of beets is now running over 17 per cent, so that a total of over 50,000 tons of sugar will be manufactured by the local plant.

The harvest of sugar beets and potatoes on the station was completed. The yields of these crops are given in the following tables.

Yields of potatoes in the irrigated rotation experiments in 1931

Rotation No.	Plot No.	Yields: Pounds per plot	Yields: Bushels per acre	Per cent marketable
4	K- IV- 21	1,780	118.7	78
20	- V- 6	2,180	145.3	79
21	- 14	3,7[illegible]	248.7	85
24	- 10	2,2[illegible]	149.3	81
25	- IV- 5	4,230	282.0	89
26	- V- 12	2,000	133.3	79
27	- 19	1,350	90.0	68
30	- IV- 17	2,320	154.7	81
31	- III- 15	2,130	142.0	73
40	- IV- 4	4,350	290.0	90
44	- 14	2,280	152.0	89
60	- III- 9	5,180	345.3	93
61	- 3	4,670	311.3	87
4-a	L- IV- 9	2,460	164.0	85
34	- 4	1,930	128.7	79
35	- 8	2,620	174.7	77
64	- 20	4,630	308.7	91
Average		2,946	196.4	83

Huntley (cont'd)

Yields of sugar beets in 1931, irrigated rotation experiments

Rotation No.	Plot No.	Yields: Pounds per plot	Yields: Tons per acre	Stand, plants per acre
2-a	K- V- 22	3,222	6.44	21,728
10	- II- 7	8,047	16.09	26,656
18	- V- 3	2,549	5.10	16,352
20	- 5	3,151	6.30	24,304
21	- 13	7,738	15.48	23,408
22	- 7	1,412	2.82	17,808
23	- 15	8,832	17.66	23,520
30	- IV- 16	3,175	6.35	22,176
31	- III- 14	9,082	18.16	26,640
32	- IV- 19	3,085	6.17	21,952
40	- 1	3,351	6.70	17,808
42	- 7	1,863	3.73	15,008
60	- III- 11	6,559	13.12	24,864
61	- 5	7,018	14.04	25,984
67	- II- 5	7,919	15.84	25,760
2-aa	L- IV- 5	5,769	11.54	23,904
34	- 3	2,047	4.09	19,776
35	- 7	7,723	15.45	23,616
46	- 10	2,684	5.37	16,320
64	- 19	3,353	6.71	21,696
37	L- I- 2	8,460	16.92	22,272
47	- 9	9,222	18.44	25,152
49	- 5	7,244	14.49	24,960
49	- 6	6,252	12.50	21,504
Average		5,407	10.81	22,215

The cooperative lamb-feeding experiment was started on October 10, when 12 lots of 30 lambs each were placed in the feed lots. They were furnished by the Montana State Station and are fine wool range lambs, averaging about 65 pounds in weight. It is planned to carry the lambs on feed over a period of 90 to 100 days. An outline of the rations being fed in each lot in the experiment follows:

Lot 1.- Barley and alfalfa.
" 2.- Barley, beet tops, and alfalfa.
" 3.- Barley, beet pulp, and alfalfa.
" 4.- Barley, beet pulp, cottonseed cake, and alfalfa.
" 5.- Barley, beet pulp, cottonseed cake, molasses, and alfalfa.
" 6.- Hard wheat, beet pulp, and alfalfa.
" 7.- Soft wheat, beet pulp, and alfalfa.
" 8.- Corn, beet pulp, and alfalfa.
" 9.- Oats, beet pulp, and alfalfa.
" 10.- Barley, bean straw, beet tops, and beet pulp.
" 11.- (Light lambs)- Same ration as Lot 4.
" 12.- (Light lambs)- Same ration as Lot 4 except three times as much cottonseed cake.

Dan Hansen.

Prosser

Report for week ending October 24

The Prosser pump plant has ceased operations for this season. The delivery was cut off entirely on October 20. The water in the Sunnyside Canal was reduced to a very low level the last of the week. The specific conductance of water samples from the Sunnyside Canal was as follows:

Date	$K \times 10^{-5}$
Oct. 16	16.8
" 23	18.5

Borders around the potato plots were dug by hand the first of the week in order to have sufficient room for the potato digger to turn.

Soil samples were taken in the orchard to determine the weight of a cubic foot of soil. Other work at the station consisted of construction of fence panels for the sheep-feeding pens. It is expected that 2,000 head of sheep will arrive at the station about November 1.

U. S. No. 1 potatoes are being sold by the farmer for $12 a ton. The first cutting of hay is selling for $5.00 a ton in the stack and $4.50 a ton for second cutting. There is not much demand for hay at this time.

The following table shows the yield of alfalfa hay from the irrigation plots in field E-4. The tons per acre are calculated on the basis of air-dry hay.

Plot	Acre-inches of water applied	Yield in tons per acre			
		First cutting	Second cutting	Third cutting	Total
1	60	2.59	3.04	1.62	7.25
2	45.3	2.62	3.00	1.60	7.22
3	35.1	2.52	2.84	1.48	6.84
4	19	1.86	1.74	1.08	4.68

Report for week ending October 31

More lettuce and cauliflower are being raised in the Yakima Valley this season than the local markets can handle. As little of these products are being shipped out, the growers are placing a considerable tonnage in storage for use later. The growers are receiving $1.25 to $1.75 a crate for that which is being sold for immediate consumption. Cauliflower is bring 70 cents a crate, but the price is expected to advance when the crop is out of the fields. As heavy frost will ruin cauliflower, the growers are hastening to harvest and store it. Growers are receiving 3 to 4 cents a pound for spinach and 35 cents a box for tomatoes. Potato shipments from the Yakima Valley were light. No. 1 grade Yakima Netted Gems was sold in Seattle at 85 cents a hundred. The price to the growers still remains $11 to $12 a ton. Wheat has recently advanced to 50 cents a bushel. Comparison of seasonal shipments of produce in carload lots from the Yakima Valley for 1930 and 1931 follow:

	1930	1931
Apples	4,948	2,438
Mixed fruit	1,661	1,081
Pears	3,501	2,617
Onions	346	407
Potatoes	2,602	2,614
Vegetables	178	109
Other crops	2,324	1,955
Total	15,560	11,221

Prosser (cont'd)

Potato plots were dug this week and corn harvest was begun. The highest yield of potatoes was obtained on the plot receiving 39.3 acre-inches of water in ten irrigations at intervals of one week. The quality of the yield was as follows: No. 1, 78.6 per cent; No. 2, 19 per cent; culls, 2.4 per cent- making a total of 10.7 tons per acre. The plot which received 77.3 acre-inches in nine irrigations at intervals of one week produced 9.6 tons of which 83.5 per cent were No. 1, 14.9 per cent No. 2, and 1.6 per cent were culls.

Meteorological conditions for the month of October:

Temperature	
Maximum	65.3
Minimum	38.5
Mean	51.9
Aspect of the sky	
Days partly cloudy	16
Days cloudy	4
Total evaporation, inches	2.816
Mean wind velocity, miles per hour	2.22

The first killing frost of the season occurred on October 12. The lowest temperature of the month, 28.5°, occurred on October 21, and the maximum, 84.5°, occurred on October 1. The total precipitation was .51 inch.

Carl A. Larson

San Antonio

Report for six-week period ending October 24

Warm, dry weather continued through the latter half of September and the first three weeks of October. Maximum temperatures were not extreme, but the mean was well above normal. The mean temperature for September was 2.6° above the normal for the past 24 years.

No precipitation of value occurred from July 18 to October 22. On the latter date there was a shower of .71 inch, which will furnish temporary relief to pastures and help fall plowing. The meteorological data for the six weeks covered by this report and for the month of September are summarized in the following table:

Week ending	Temperature						Precipitation	Aspect of the sky		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean						
							Inches	Days	Days	Days
Sept. 19	98	95.7	67	71.7	83.7	26	.13	1	6	0
" 26	98	96.6	69	71.1	83.9	28	--	1	6	0
Month of Sept.	98	95.4	58	69.1	82.3	34	.13	13	17	0
Oct. 3	95	91.0	58	63.4	77.2	34	--	6	1	0
" 10	97	94.7	70	72.7	83.7	25	.35	2	5	0
" 17	95	90.1	50	63.6	76.9	33	.13	2	4	1
" 24	93	88.9	56	64.6	76.7	30	.71	2	5	0

San Antonio (cont'd)

Dr. O. F. Cook and Mr. Pressley, of the Division of Cotton, Rubber, and Other Tropical Plants, made a brief stop at the station the night of September 19. Messrs. C. S. Scofield and S. H. Hastings, of this division, spent three days, October 7 to 9, at the station.

Only one crop of hay sorghums planted broadcast was harvested this season, as the drought inhibited growth of the second crop. Two crops of hay sorghum planted in cultivated rows were obtained. A second crop from early planted grain sorghums in the variety planting was allowed to mature. Although the dry weather stunted the plant growth and all heads were small, a very satisfactory crop was set on all varieties, with relatively little midge damage. Sparrows were present in large numbers, however, and destroyed much of the grain. A variety planting of grain sorghums made June 18 on land held in clean fallow since November 1930 produced unusually rank plant growth and set a heavy crop of seed. Damage done by the sorghum midge was light, but it was estimated that birds took from 25 to 100 per cent of the grain. The taller growing, early maturing Dwarf hegari suffered complete loss of grain, while the smaller amount of damage occurred in the plots of Beaver milo- a much shorter, more densely foliated variety.

Threshing of all grain sorghums was completed; corn samples kept for moisture determination and shelling percentage have been weighed and shelled; air-dry percentages for hay crops have been determined; and yields have been computed for these crops and for all cotton experiments. Final counting and mapping of rootrot for all cotton plantings on the station was completed during the period October 15 to 22, inclusive.

The following tables give plot yields and other agronomic data for cotton, corn, milo, Sumac sorgo, and Sudan grass as grown in the rotation and tillage experiments for 1931.

Yields of sorgo in 4.1-ft. rows and in 8" drills, and of Sudan grass, from rotation and tillage experiments - 1931

Rotation	Plot	First crop			Second crop			Third crop			Total yield, t.acre
		Date cut	Ht., in.	Pounds per plot	Date cut	Ht., in.	Pounds per plot	Date cut	Ht., in.	Pounds per plot	
				Sorgo in 4.1-ft. rows							
A4-E	A4- 9	7- 3	68	895	9-17	56	735	--	-	---	4.08[2]
A6-4	A6- 4	7- 3	60	795	9-17	60	1,030	--	-	---	3.65
B5-5	B5- 5	7- 3	64	770	9-17	44	655	--	-	---	2.85
A	10	7- 3	68	1,155	9-17	54	1,200	--	-	---	4.71
C	14	7- 3	68	1,170	9-17	54	970	--	-	---	4.28
				Sorgo in 8-inch drills							
A4-F	A4-11	7-15	48	1,405	--	-	---	--	-	---	2.81
G	15	7-15	48	1,380	--	-	---	--	-	---	2.76
B4-12	B4-12	7- 3	(1)	0	--	-	---	--	-	---	0
13	13	7- 3	(1)	0	--	-	---	--	-	---	0
B5-6	B5- 6	7-14	40	1,280	--	-	---	--	-	---	2.56
B	12	7-15	46	1,840	--	-	---	--	-	---	3.68
C	16	7-15	46	1,375	--	-	---	--	-	---	2.75
				Sudan grass in 8-inch drills							
A6-F	A6-18	6-15	64	1,585	7-30	72	1,260	10-9	44	460	6.61
B4-A	B4-14	6-15	54	960	7-30	60	885	10-9	38	380	4.45

(1) Growth on plots was estimated to consist of at least 90 per cent and 75 per cent, respectively, pig weeds and was of no value.

2/ One-fifth acre plot.

San Antonio (cont'd)

Yields of seed cotton from rotation and tillage experiment plots, also percentage of plants dead of rootrot on each plot at time of picking and at end of season.

Rotation	Plot	Yield of seed cotton per acre (lbs.)	Plants dead of rootrot (%) Time of picking 9-10	End of season 10-22
A4-A	A4- 1	94	94.6	98.6
D	7	162.5	38.0	76.8
F	12	140	.5	1.7
G	16	186	3.2	9.8
19	19	128	20.1	39.0
A5-A	A5- 1	96	3.9	5.7
B	4	152	1.5	2.3
C	8	158	56.6	67.2
C	10	168	72.1	84.6
D	12	260	20.5	38.2
D	14	238	7.5	15.6
E	16	272	.5	1.3
E	18	260	.7	2.3
A6-3	A6- 3	158	46.6	72.3
B4-A	B4-15	148	.08	.9
B	18	124	.6	1.8
B5-3	B5- 3	142	6.3	17.2
4	4	160	13.4	24.0
A	9	266	20.9	52.4
B	11	220	58.0	82.8
E	17	156	52.7	74.9
B6-A	B6- 2	228	20.8	31.1
B	4	192	10.6	20.7
C	6	300	18.5	26.9
D	8	284	25.3	30.5
E	10	360	35.3	53.2
F	12	214	61.9	79.2
G	14	198	66.5	83.9
H	16	200	35.9	75.1
I	18	272	50.0	83.0
Average		198	27.1	41.3
Maximum		360	94.6	98.6
Minimum		94	.08	.9

San Antonio (cont'd)

Yields of corn from rotation and tillage experiments with stand, shelling percentage, and test weight for each plot for 1931, and yield rank of each rotation for 1931 and for the period 1909 to 1931, inclusive.

Rotation	Plot	Stand, plants per acre	Yield* per acre, bushels	Shelling percentage	Test wt. per bushel	Yield rank	
						1931	Average 1909 to 1931, inclusive
A4- B	A4- 3	5,656	27.4	82.2	59	19	19
D	8	6,025	31.4	83.5	59	18	18
A6- A	A6- 7	5,328	32.7	84.3	58	15	1
B	9	5,328	34.8	83.5	60	13	15
C	11	5,168	35.1	81.7	58	12	2
D	13	5,368	38.5	82.9	58	9	14
E	15	4,848	26.8	76.1	58	20	10
F	17	5,144	38.8	83.2	60	8	12
B5- 1	B5- 1	5,248	32.4	83.5	57	17	17
2	2	5,240	25.8	79.9	58	21	16
C	13	5,488	34.1	81.8	59	14	20
D	15	5,384	32.6	84.2	59	16	21
B6- A	B6- 1	5,608	40.3	79.0	58	6	6
B	3	5,464	40.4	86.2	59	5	4
C	5	5,400	36.0	82.8	60	11	9
D	7	5,864	43.1	85.1	59	1	8
E	9	5,776	43.1	82.2	58	2	3
F	11	5,536	41.7	83.3	59	3	7
G	13	5,336	39.6	82.7	59	7	11
H	15	5,280	37.1	81.1	59	10	13
I	17	5,576	40.6	83.9	60	4	5
Average		5,432	35.8	83.4	59		
Maximum		6,025	43.1	86.2	60		
Minimum		4,848	25.4	76.1	57		

* Crib-dry ear corn; 70 pounds per bushel.

San Antonio (cont'd)

Yields of Dwarf Yellow Milo from rotation and tillage experiments. The rank of the rotations in 1931 is compared with their average rank during the period milo has been grown in the rotations - 1931.

Rotation	Plot	Estimated percentage		Yield per acre		Yield rank	
		Lodged	Damaged by birds	Grain, bu.	Fodder, tons	1931	Average 1912 & 1913 to 1931 3/
A4- F	A4-14	40	5	28.1	1.34	8	7
G	18	50	5	25.0	1.40	11	6
A5- A	A5- 2	60	5	34.3	1.60	5	5
B	5	80	10	39.3	1.62	3	2
C	7	60	10	38.4	1.81	4	4
D	11	80	10	43.0	1.99	2	1
E	15	75	15	43.8	2.03	1	3
A6- 1	A6- 1	(1)	--	0	0	14	14
2	2	(1)	--	0	0	14	9
1A	6	5	20	26.8	1.73	9	13
D	14	60	40	24.7 2/	3.19 2/	12	12
B4- A	B4-16	50	5	33.7	1.44	7	10
B	19	30	10	34.0	1.67	6	8
B5- E	B5-18	10	10	25.4	1.37	10	11
Average		50	12	32.9	1.75		
Maximum		80	40	43.8	3.19		
Minimum		5	5	0	0		

1/ Stand on plots A6-1 and 2 almost completely destroyed by an unnamed root disease which attacked the plants in the seedling stage.

2/ A second crop from this plot, harvested 10-5-31, had been damaged by sparrows approximately 25 per cent, was not lodged, and yielded 8.7 bushels of grain and 1.66 tons of fodder per acre. Figures given include both crops.

3/ Milo was first included in the rotations on fields A-4, A-5, and B-4 in 1913 and on fields A-6 and B-5 in 1912.

Geo. T. Ratliffe.

Scotts Bluff

The average maximum temperature for the two-week period ending October 31 was 62°, and the maximum 78; the average minimum was 32 and the minimum 15. The precipitation was .41 inch, making a total for the year of 6.32 inches. The average wind movement was 9.8 miles per hour.

One of the hardest and most destructive dust storms for many years occurred on October 26. All over the project fences were blown down when tumble weeds piled up against the north-south lines. Many outbuildings and windmills were wrecked, and in the sections of lighter soils roads were impassable from sand drifts. This was followed by three days of continued high winds. The wind movement for the entire four days averaged 17.5 miles per hour.

Scotts Bluff (cont'd)

The weather conditions have been ideal for beet harvest with the exception of this storm, which did not greatly interfere with the beet harvest. The harvest is between 80 and 85 per cent completed and many growers will finish this week. The average yield will probably be low, though there are many fields of early planted beets that are making their usual heavy yields. The sugar content, however, will be higher than usual.

At the station the period has been spent in completing the potato harvest on the Walker place and the beet harvest on both places. The beets in field K and the experimental plots on the Walker tract are out and only about two days work is left in field E. The yields are below the average, but the sugar content is high, varying from 16.5 to 18.2 per cent. This report of sugar content comes from the laboratory of the Sugar Company. Samples from each plot are being tested by the Division of Sugar Plants at Scotts Bluff, but no reports have yet been received from these. It will probably not be possible to check the two tests very closely as the Sugar Company's tests are from the average of each day's delivery, which may consist of plots from widely varying rotations.

During the past two weeks, with the exception of the four days of high winds, water has been run through the main canal of the Pathfinder Irrigation District which supplies water to the two reservoirs, Lake Alice and Lake Minatare. At the end of the irrigating season both of these were empty, and water is being taken from the natural flow of the river to fill them to winter capacity.

James A. Holden.

Newlands

The average maximum temperature for the two-week period ending October 31 was 68.5, with a maximum of 74 on the 23d; the average minimum was 33.9, with a minimum of 20 on the 27th. The mean temperature was 51.2. The average hourly wind movement was 3.1 miles. There was no precipitation during this period.

The work at the station has been somewhat curtailed. Mr. Lewis resigned to take a position as electrician with the local irrigation district. No attempt has been made to fill the vacancy, as it was thought best to wait until spring before employing additional help. Before his resignation the working force had been reduced to the usual number employed during the winter. At present one man is employed full time in running the tractor. Gradually additional areas are being leveled and old areas reworked. There should be a great improvement in the appearance of the farmed area of the station in another year.

Farming conditions on the project remain about the same. Little improvement can be seen in the economic phase of farming operations. Very little hay is being sold. The little exchanging hands is bringing $7.00 a ton in the stack. Several thousand head of beef and sheep are being fed in the valley. Most of this feed was contracted for during the late summer. Butterfat is selling for 32 cents a pound and eggs for 34 cents a dozen. The price of turkeys is still undetermined but probably will be a little less than last year. There are fewer turkeys on the project than there were last year, but an increase is reported

Newlands (cont'd)

in the number of turkeys in California. The local turkeys, however, seem to be maturing a little earlier, so that a larger portion than usual should be ready for the Thanksgiving market. The present indications are that this will be the better market.

The Nevada Agricultural Experiment Station has commenced another winter feeding experiment with pigs in dry lot. Rations of alfalfa meal, ground barley, and skim milk are to be used. Similar tests conducted last year showed the need of further experiments of this kind. The alfalfa and barley are ground at the station and mixed, then fed by means of self-feeders.

E. W. Knight.

M I S C E L L A N E O U S

Mr. S. H. Hastings, Principal Agronomist, returned to Washington on October 30 from a trip to the Southwest.

Printer's proof of several bulletins of this division in process of publication has been read and checked during the last few weeks.

W E E K L Y R E P O R T S

Of The Division Of

WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

Vol. XXXIII November 7 and 14, 1931 No. 21

Belle Fourche

For the week ending November 7 the maximum temperature was 60 and the minimum 24. There was no precipitation.

The following table gives the yield of sugar beets per acre in the irrigated rotations for 1931:

Sugar Beet Yields in the Irrigated Rotations
Belle Fourche Field Station, 1931

Rot. No.	Plot No.	Yield per plot	Yield per acre	Yield of tops per ac.	Per cent sugar	Per cent purity	Sugar per acre	Stand per acre	Weight per beet
		Lbs.	Tons	Tons			Lbs.	M	Ozs.
2a	III-30	2,328	4.66	5.74	16.0	83.8	1,250	16.79	8.9
2n	I-45	5,864	11.73	6.79	17.1	88.3	3,543	26.58	14.1
18	24	2,237	4.47	6.48	15.8	84.3	1,190	19.79	7.2
19*	46	2,505	5.01	7.82	15.4	83.1	1,282	17.73	9.0
20*	26	3,215	6.43	9.05	16.3	86.5	1,813	23.63	8.7
21*	28	5,473	10.95	10.03	16.9	86.8	3,212	25.29	13.9
22	30	4,971	9.94	8.66	16.4	87.8	2,862	24.86	12.8
23	32	7,595	15.19	8.83	16.9	88.3	4,533	25.12	19.4
29*	48	3,311	6.62	10.08	16.3	85.6	1,847	19.94	10.6
30	17	3,535	7.07	3.58	16.7	87.5	2,068	22.86	9.9
31	20	4,138	8.28	4.92	15.7	88.0	2,288	23.37	11.3
32	III-11	2,700	5.40	5.04	16.0	86.4	1,493	22.31	7.7
34*	II-42	4,536	9.07	9.95	16.5	85.3	2,553	23.51	12.3
35*	45	5,860	11.72	8.67	17.0	86.0	3,427	23.15	16.2
40	I- 3	4,721	9.44	14.95	14.3	81.5	2,000	19.41	15.6
42	7	4,205	8.41	12.29	13.9	80.5	1,882	18.11	14.5
46*	II- 4	1,676	3.35	6.67	13.4	79.2	801	19.20	5.6
47	III-41	5,664	7.17	10.70	15.7	83.8	1,886	22.69	10.1
49	I-49	4,688	9.38	6.36	16.7	87.7	2,748	27.66	10.9
49*	52	4,963	9.93	8.88	17.3	87.0	2,989	24.95	12.7
60	10	5,354	10.71	13.42	16.0	83.3	2,855	23.77	14.4
61	II-14	7,752	15.50	16.10	16.5	84.9	4,343	26.13	19.0
62	8	4,790	9.58	12.87	15.5	84.6	2,513	23.18	13.2
64*	III-43	3,458	7.17	14.95	13.2	78.5	1,486	23.13	9.9
66	II-24	1,732	3.46	6.06	14.8	83.9	859	19.26	5.7
71	35	5,441	10.88	17.35	14.5	81.9	2,584	22.19	15.7
Maximum		7,752	15.50	17.35	17.3	88.3	4,533	27.66	19.4
Minimum		1,676	3.35	3.58	13.2	78.5	801	16.79	5.6
Average		4,335	8.52	9.47	15.8	84.8	2,319	22.48	11.9

Plot III-41 contains approximately .39 acre. All plots were seeded on April 28. The plots marked with an asterisk were reseeded June 1.

Belle Fourche (cont'd)

On September 30 ten samples of ten beets each were taken from each rotation for sugar analysis. This analysis was supervised by S. B. Nuckols, of the Division of Sugar Plants. The yield of tops was obtained by weighing the tops from the samples taken for sugar analysis and multiplying this weight by the actual stand on the plot. The beets collected for analysis averaged 2 ounces heavier than those actually harvested from the plots. This may account, to some extent, for the heavy yields of tops in proportion to beets. On October 26 ten samples of ten beets each were taken from rotation 35, plot A-11-45. This second sample showed an increase of 2.4 per cent in sugar content and 2.1 per cent in purity over the sample taken on September 30. This is in line with the increase in sugar content obtained at the factory. The average yield of sugar beets in 1931 was 8.52 tons per acre as compared with 12.41 tons in 1930 and the average of 10.01 tons for the period 1912 to 1930, inclusive.

The sugar beet harvest is practically completed in this territory. The average yield is estimated at about 9.5 tons per acre. The factory run will be completed about the last of this month.

The autumn has been exceptionally favorable for fall work.

Beyer Aune.

Huntley

For the two-week period ending November 7 the maximum temperature was 47 and the minimum 18. The precipitation was .17 inch.

Favorable weather continued during this period. Good progress was made in the sugar beet harvest, which is nearly completed. There were no serious delays in the beet harvest at any time during the season and the unusually large acreage was gathered in record time.

Winter feeding of lambs is well under way on the project, although there are apparently fewer lambs being fed than in previous seasons because of the low and uncertain market and the comparatively high prices for feed.

Alfalfa hay continues to sell at $8 to $10 a ton and barley at 90 cents to $1.00 a hundredweight. The price of butterfat has advanced to 26 cents a pound and eggs are selling at 35 cents a dozen.

Fall plowing and other field work was completed at the station.

Station visitors were Messrs. J. S. Cole and R. S. Towle, of the Division of Dry-Land Agriculture.

Dan Hansen.

Prosser

Report for week ending November 7

On November 6 903 lambs arrived at the station. About 400 from this number will be chosen for feeding experiments with home-grown feeds.

The irrigation plots with corn were harvested this week. The highest yield was 44.6 bushels per acre on the plot which had four irrigations at intervals of 15 days. The plot which had 3.7 acre-inches at intervals of ten days yielded 36.8 bushels.

The results from orchard irrigation are being calculated. Water applied to the plots was as follows: Plot 4, 9 hours run or 3 acre-

Prosser (cont'd)

inches; plot 5, 12 hours run or 4 acre-inches; plot 6, 18 hours run or 6 acre-inches. The water was applied every 15 days for five months. Ten locations on each plot were sampled for moisture, and the percentage of moisture found was converted into acre-inches. The average increase or decrease in acre-inches of water in the 6-foot layer of soil around a specific tree on each plot was as follows: Plot 4, 1.01 increase, 0.95 decrease; plot 5, 2.94 increase, 1.88 decrease; plot 6, 3.53 increase, 2.87 decrease. The run-off water amounted to ten per cent of the total applied.

Wheat has advanced to 65 cents a bushel, which was the only important change in the market.

The precipitation was 0.7 inch.

Farm work at the station during the week ending November 14 consisted of weighing and separating sheep for feeding lots, chopping hay, and grinding wheat and oats.

The price of wheat advanced to 70 cents a bushel the first of the week, but declined to 68 cents at the week-end. The potato market in the Yakima Valley has barely held the slight advance made a week ago. Most of the purchases at the week-end were at $13 a ton to the growers for the No. 1 grade in sacks, but in most cases farmers refused offers at this price. The government estimate for Washington was 6,900,000 bushels as compared with 7,084,000 bushels October 1.

The movement of hay last week was much lighter than a year ago, the loadings being no more than 50 to 75 per cent as great. During the last of the week 152 cars were shipped compared with 215 cars on the corresponding date last year. The movement is 1,315 cars short of that of a year ago. The excellent pasture on the coast together with the mild weather has made the requirements light, and dealers have not laid in the customary stocks. Growers are receiving from $7 to $9.50 a ton for hay and 22 to 24 cents a pound for turkeys.

Some progress has been made in growing asparagus on the salty land that has been abandoned near Sunnyside. This has been accomplished with some degree of success by allowing water to run through a furrow directly on top of the plants. Asparagus beds have been started by allowing water to run in a deep furrow, then transplanting the roots directly in this furrow.

The highest temperature for the first half of November was 70°, the minimum 25, and the greatest daily range 30. The total rainfall for this period was 1.05 inches.

Carl A. Larson.

San Antonio

Unusually warm and dry weather has continued during the two weeks ending November 7. The mean temperature for the month of October was 7.3° above normal and 2.2° higher than ever previously recorded at this station. Precipitation during October was 1.49 inches below normal, there having been only one local shower (.71 inch) that was even of temporary value. The total precipitation since last July 18 has been only 2.17 inches with the result that all fields are extremely dry and present prospects for winter grains and pasturage are poor.

San Antonio (cont'd)

A summary of climatological data recorded during the period covered by this report and for the month of October is given in the following table:

Week ending	Temperature						Precipitation inches	Aspect of the sky, days		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean						
Oct. 31	92	84.9	42	55.6	84.9	40	.16	4	3	0
Month of October	97	89.8	42	64.6	77.2	40	1.35	12	18	1
Nov. 7	84	82.4	50	54.6	68.5	32	--	3	3	1

Station activities during this period have included plowing fields B-4, C-3, D-3, F-3, and 16 rotation plots. Two rotation plots were subsoiled and one was manured. All cotton stalks were mowed and raked and about half of them burned.

Geo. T. Ratliffe.

Scotts Bluff

The average maximum temperature for the week ending November 7 was 68°, with a maximum of 76; the average minimum was 31, with a minimum of 25°. The average hourly wind movement was 5.6 miles. No precipitation was recorded.

Good weather conditions have continued. The beet harvest is practically completed; probably not over 5 per cent remain in the field. Because of unusually good weather and late moisture the yield is heavier than was expected. The field men of the Sugar Company are estimating that the average yield will be about 14 tons per acre. The sugar content will be considerably higher than it has been previously.

The number of sheep fed in the valley is not going to be as great as was predicted earlier in the season. The secretary of the Lamb Feeders' Association has estimated that there will be about 200,000 on feed in this district as compared with 335,000 last year and 485,000 the year before. At the beginning of the season hay was held at from $6 to $8 a ton. It is said that this price caused many of the larger feeders to go to the central part of the State where hay could be obtained for $3 or $4 a ton. The price of hay in the valley is coming down now, some of the feeders purchasing it at $5 to $5.50 a ton.

A good many cattle are also being fed in the valley. At this time there is the greatest spread between feeder and fat cattle prices that has been known in many years.

The poultry marketing association rejected the bids which it received for its turkeys this week as the prices were unsatisfactory. Bids will again be received on the 10th. The number of turkeys in this section this year is about 3 per cent less than normal, and the number that is being prepared for the Thanksgiving market is also smaller than usual. Many of the growers are not planning to market any at this time but will wait for the later market. The turkeys at the station are the best quality that we have ever raised. They have made good gains and are in prime condition.

Scotts Bluff (cont'd)

The price of eggs has again dropped and has held stationary for some time at 25 cents a dozen. The unusually warm weather has brought a big flow of eggs, and better prices cannot be expected until cold weather. Sour cream has also declined to 30 cents per pound of butter-fat. Lamb prices declined during the week with a top of $6.25 for fat and $4.75 for feeders at Omaha. Hogs made a small advance during the week, the tops being $4.70.

James A. Holden.

Umatilla

Under date of November 10 Mr. Dean reported the following progress in the development of the new station:

"During September and early October approximately 90 acres of land which will not come under development next year was roughed down with the float and seeded to rye. We have had two or three very severe winds. The rye is growing well now and should hold the land from any blowing except during very severe storms.

"Grading work on approximately ten acres of land for pasture is about two-thirds completed. When the grading is finished the land will be diked, ditched, and "strawed" to prevent soil blowing. Then it is planned to commence work on the southwest forty, which will eventually be in plots. I am still undecided whether to grow a crop of rye or wheat on it next year to measure the soil variation or to put it all into alfalfa next spring, measuring variation with the alfalfa for two or three years and at the same time building up the soil.

"The building contractors began work on October 15 and have made good progress, the weather being favorable. The concrete work is all completed with the exception of the floors, which will be poured after the buildings are inclosed. The rafters are up on the Superintendent's and Dairyman's residences and the office building. The rough siding has been put on, and the roof on one residence was completed today. The studding is all up on the farm buildings and the rafters are in place on the machine shed. The concrete pipe for the upper part of the pumping line, which will also serve for gravity water from the feed canal, is on the ground."

Yuma

Climatic conditions for the four-week period ending November 14 have been very favorable for the harvesting of fall crops. The two light showers that were recorded during the weeks ending October 24 and November 14 did not interfere with the field work. The latter rain was quite general over Arizona and California. In the Salt River Valley the precipitation was over two inches and on the coast slightly over an inch. The first frost of the fall has been reported on the lower section of the project around Gadsden. The weather data for the last four weeks are shown in the following table.

Yuma (cont'd)

Week ending	Temperature						Precipitation, inch
	Maximum		Minimum		Mean	Greatest daily range	
	Absolute	Mean	Absolute	Mean			
Oct. 24	92	83	45	49	66	41	.01
" 31	93	89	45	52	70	47	--
October	98	89	42	53	71	47	.32
Nov. 7	95	92	46	50	71	49	--
" 14	84	76	35	46	61	38	.17

The discharge of the Colorado River for the month of October, as reported by the U. S. Bureau of Reclamation gauging station at Yuma, was 405,300 acre-feet. The 29-year average for the month is 666,000 acre-feet. The present flow of the river seems to be adequate for the needs of the Imperial Valley.

Cotton picking and ginning on the project continue to lag behind last year. About 6,000 bales have been turned out to date compared with 16,000 last season. The damage caused by the salt marsh caterpillars is quite severe to the cotton crop, especially in the Yuma Valley. The late bolls which promised a normal crop have opened prematurely on account of the plants being defoliated by the caterpillars.

In most instances the companies which have been financing the cotton growers have been holding all cotton for the growers. The anticipation of better prices encourages the growers to pick their own cotton instead of turning the crop over to the finance companies. Local lint prices are about a cent under eastern spot quotations.

Very little alfalfa hay and seed is being sold. Early lettuce prospects look encouraging. This crop is approaching maturity rapidly.

Work on the station during the past month has included the picking of cotton; harvesting and threshing grain sorghums; plowing, disking, and seeding barley, wheat, and alfalfa plots; pruning date palms; repairing the station cotton gin; planting strawberry and garden plots; general irrigating and cultivating.

Messrs. S. H. Hastings, C. J. King, and Harry Stewart visited the station on October 21 and 22 and Mr. T. H. Kearney on November 1. Messrs. J. H. McCormick and C. H. Taylor, of the Bureau of Agricultural Engineering, on November 23 inspected the rotation plots in regard to their cooperative work. Mr. J. S. Townsend, of the Division of Cotton, Rubber, and Other Tropical Plants, returned to the station on November 2 to complete the repair work on the ginning equipment.

E. G. Noble.

W E E K L Y R E P O R T S

Of The Division Of

WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

Vol. XXXIII November 21 and 28, 1931 No. 22

Belle Fourche

Under date of November 21 Mr. Aune reported as follows:

"Today we have the first touch of winter. The minimum temperature last night of 4° above was accompanied by a very high wind from the northwest that made it feel like 25° below. All of the field work for this fall has been completed.

"The sugar factory made its October payment for beets on schedule. It has had an exceptionally good operating season. The average sugar content will be 17 per cent.

"The failure of the First National Bank at Belle Fourche about three weeks ago has been a blow to this community. Eighty per cent of the business men at Belle Fourche and a large number of the ranchers in both the irrigated and dry-land sections of this territory had dealings with this bank."

Newlands

The average maximum temperature for the three-week period ending November 21 was 58.4, with a maximum of 81 on the 9th; the average minimum was 24.2, with a minimum of 11 on the 12th. The mean temperature was 41.3. The average hourly wind movement was 2.76 miles. The precipitation was .43 of an inch.

The rearrangement of some of the station fields has been continued, but the very cold weather of the last few nights has handicapped the speed with which the work was being accomplished. Zero weather makes tractor operations rather difficult. The ground soon becomes frozen and very little can be accomplished with plows or scrapers. However, the work will continue. If the field alterations become too difficult, there is a sand-hill to be removed. By working the east side of such hills, tractor operations can generally be maintained throughout our coldest weather.

The recent cold spell was accompanied by heavy snow-storms in the mountains. In the higher altitudes snow fell to a depth of some 6 feet, which resulted in over 3 feet of closely packed snow after the fall had settled. The recent cold weather has frozen the pack so that it should form an ideal base for further snows. This has been the heaviest snow this early in the season in many years. Hopes are held that future storms will increase the total snow coverage to many feet. Snows over 25 feet deep have been recorded. If such a fall would occur this year, there would be no fear of a water shortage next summer. The recent heavy storms have at least temporarily relieved the project farmers of the fear of a further immediate water shortage.

Newlands (cont'd)

The Thanksgiving pool of project turkeys have been sold through the Northwestern Turkey Growers' Association. The price received was 32 cents a pound for prime turkeys and 28 cents a pound for choice. All prices were f.o.b. San Francisco. The officials of the association felt gratified over these prices as they were a few cents higher than any other western pool sold to date. The Newlands project has established in previous years a reputation for excellent turkeys. This undoubtedly influenced the price offered for the local pool. Four cars were shipped for the Thanksgiving market, and it is expected that eight or more cars will be ready for the Christmas market.

The laboratory work on waters for private individuals has decreased greatly during the past month. To date the number of samples submitted for analysis during the year shows a decided increase over previous years. This no doubt is due to the drought of the past season.

In addition to the private samples, the 50 odd wells on the station area continue to be sampled monthly and analyzed for their salts and boron content.

The boron determinations are being made by the new Cavanagh electrometric method, in addition to the distillation method. It is considerably quicker and more accurate than the distillation method. The data accumulated on the boron content of both underground and surface waters of this vicinity indicate that boron exists in amounts as high as 55 parts per million. Underground waters as a whole though are generally run from .3 p.p.m. to 7 or 8 p.p.m. of boron.

E. W. Knight

Prosser

Report for week ending November 21

The Washington Irrigation Institute held its annual meeting at Wenatchee, Washington, November 20 and 21. Topics dealing with the Columbia Basin project, bankrupt irrigation districts, conservation of watersheds, and many other irrigation problems were discussed. The construction of Rock Island Dam in the Columbia River at Wenatchee has progressed to the point where some power is being generated. Much interest is being shown by orchardists in pumping projects in the vicinity of Wenatchee because of the cheap power. Some orchardists are lifting water as high as 370 feet with a total cost for irrigation of 4 to 6 cents per box of apples.

During the past week there has been little change in the markets in the Yakima Valley. Wheat has declined to 65 cents a bushel, but potatoes have held their advance and are now selling for $13 to $14 a ton.

The minimum temperature, 26° F., occurred on November 21 and the maximum, 54°, on November 19. The rainfall was 0.12 inch.

Farm work for the week ending November 28 consisted of chopping hay and feeding sheep.

The price of alfalfa hay has increased from $7.50 and $9.00 a ton to $8 and $10 a ton. Potatoes have continued to advance in price and are now being sold by the growers for $15 and $16 a ton. Wheat has decreased in price to 60 cents a bushel.

Prosser (cont'd)

A comparison of the seasonal shipments of produce from the Yakima Valley in carload lots for 1930 and 1931:

	1930	1931
Apples	7,593	3,769
Mixed fruit	1,701	1,122
Pears	3,769	2,808
Onions	447	478
Potatoes	3,004	3,083
Vegetables	236	165
Other crops	2,324	1,955
Total ...	19,074	13,380

Accompanied by a low temperature, 3.4 inches of snow fell in the Yakima Valley on November 25. The lowest temperature for the year, 4° F., occurred on November 27. The maximum for the week was 39°. and the mean 22.2°.

Reclamation engineers have found that the leaks in the Kittitas siphon under the Yakima River near Ellensburg were due to large cracks. Repairs are to be made before the next irrigation season begins.

Carl A. Larson.

San Antonio

Temperatures during the two-week period ending November 21 continued well above normal while precipitation was negligible. There was much cloudy, threatening weather, and during the last week the minimum temperature was 43 on three nights.

Summary of the Climatological Data

Week ending	Temperature						Precipitation	Aspect of the sky		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean						
							Inch	Days	Days	Days
Nov. 14	86	84.4	57	61.7	73.1	28	--	0	5	2
" 21	86	81.7	43	51.3	66.5	37	.39	3	1	3

Field work included manuring, plowing, and subsoiling rotation plots.

The conversion of the frame room at the northeast corner of the office building into a hollow tile, fire-proof room was started on November 18.

Geo. T. Ratliffe.

Scotts Bluff

The average maximum temperature for the week ending November 21 was 45°, with a maximum of 60; the average minimum was 15, with a minimum of 5°. The average hourly wind movement was 8.3 miles. The period closed with the beginning of the storm period that has covered much of the Northwest. About 3 inches of snow, accompanied by considerable wind, fell on Saturday and continued through Saturday night. The pre-

Scotts Bluff (cont'd)

cipitation amounted to 0.11 inch, making a total of 6.50 inches for the year. According to unofficial advices from the North Platte watershed, the snowfall is much heavier now than usual.

The yields of sugar beets on the station are given in the following table.

Yields of Sugar Beets at the Scotts Bluff Field Station, 1931

Rotation No.	Yield per plot	Yield per acre	Stand	Number of beets per plot	Average weight per beet
Field K	Pounds	Tons	%		Pounds
23	8,757	17.51	78	4,992	1.75
21	7,387	14.77	89	6,136	1.20
31	8,050	16.10	78	5,356	1.50
61	8,938	17.88	79	5,408	1.65
40	7,896	15.79	73	5,044	1.56
20	3,599	7.20	77	5,304	.68
2	2,239	4.48	76	3,952	.57
18	3,550	7.10	61	4,160	.85
30	2,739	5.48	73	4,992	.55
60	6,998	14.00	71	4,836	1.45
42	7,529	15.06	73	4,992	1.51
22	2,485	4.97	65	4,472	.56
32	3,415	6.83	74	5,096	.67
62	5,937	11.87	75	5,148	1.15
45 (1st year)	8,493	16.99	77	5,252	1.62
45 (2d year)	7,060	14.12	85	5,824	1.21
64	7,879	15.76	80	5,460	1.44
71 (1st year)	7,180	14.36	76	5,252	1.37
71 (2d year)	6,837	13.67	76	5,252	1.30
Average	6,156	12.31	76	5,101	1.20
Field E					
Series I, Plot 7	6,057	12.11	44	2,928	2.07
" 8	5,374	10.75	46	3,072	1.75
" 9	5,005	10.01	53	3,504	1.43
" 10	5,386	10.77	59	3,936	1.37
" 11	5,232	10.46	49	3,264	1.60
Series II, " 7	5,625	11.25	53	3,552	1.60
" 8	6,547	13.09	46	3,072	2.13
" 9	6,424	12.85	44	2,928	2.19
" 10	6,900	13.80	55	3,648	1.89
" 11	8,237	16.47	53	3,552	2.32
41	6,900	13.80	89	5,952	1.16
33	7,250	14.50	68	4,560	1.59
46 (Following oats)	4,370	8.74	34	2,256	1.94
46 (" potatoes)	3,319	6.64	35	2,304	1.44
49	5,729	11.46	47	3,120	1.84
Average	5,890	11.78	52	3,443	1.71
Average, both fields	6,039	12.05	65	4,370	1.44

Scotts Bluff (cont'd)

The average yield for the untreated plots was 6.01 tons per acre; alfalfa plots, 14.50 tons; alfalfa and manure, 15.30 tons; manured, 16.13 tons; and sweet clover, 15.56 tons. The decrease in yields in field E was partly because of late planting, which necessitated irrigation to germinate the seed.

The Pathfinder officials have been continuing the flow into Lake Minatare in the effort to fill it. However, the amount of water that has been allowed for this purpose has been reduced so much that the lake is filling very slowly. It is probable that this storm will make it necessary to close the headgates entirely.

The two east rows of trees of the windbreak west of the buildings was taken out during the week. These were Russian mulberries and jack pines, neither variety being of very much value. The mulberries winterkill and the jack pines do not thrive in this section. They will be replaced with Black Hills spruce.

O. R. Mathews and V. I. Clark, of the Ardmore station, visited the Scotts Bluff Field Station during the week.

The average maximum temperature for the week ending November 28 was 27°, with a maximum of 39; the average minimum was 4, with a minimum of 1° below zero. The average wind movement was 7.2 miles an hour. The precipitation amounted to 0.05 inch, making a total of 6.55 inches for the year.

At the station only the routine work of caring for the stock has been carried on. The lambs on test feeding with wheat are making very satisfactory gains. They will complete the 100-day period next week and be shipped to make room for the usual winter feeding test.

The steers that were on pasture this summer and are now being fed have made very good gains. The price of this class of cattle is the only bright spot in the livestock market, all other kinds of livestock being at record lows. The top price for heavy fed steers at the end of the period was $12.75, while choice hogs brought $4.25 and fat lambs sold for a top of $6.15.

Dairy products have also declined greatly, butterfat now selling for only 25 cents a pound. Eggs have advanced and are now selling at 35 cents a dozen for the best grades.

Wheat and corn have also made slight advances in price, but not much wheat has been sold. About 20 cents a hundred has been added to wheat and 5 cents to corn.

The following table gives the results of the summer pasturing experiment with pigs on rotation 65 in which the corn plot was hogged down.

Summary of Pasture Test With Pigs

Item		1st period alfalfa pasture, 2% corn	2d period alfalfa pasture, 2% corn	3d period alfalfa pastr. hogged corn
Number of pigs in test		10	5	5
Number of days in test		60	52	19
Total initial weight	lbs.	870	725	1,010
Total final weight	"	1,340	1,010	1,215
Total gains	"	470	285	205
Av. daily gain per pig	"	0.78	1.09	2.10
Lbs. corn fed per 100 lbs. gain	"	271	281	453

James A. Holden.

Umatilla

Under date of December 1, Mr. Dean made the following report on the progress of building operations on the new station:

"The contractors were getting along very well with the buildings, had everything under cover, practically all of the concrete work done, part of the siding on the residences and the office, and were ready to go ahead with the windows and indoor work when on November 25 a severe snow-storm followed by cold weather stopped all work. It is problematical just when work can be resumed. The snow is still on the ground and the temperature is below freezing with no appearance of moderation. I am hoping, however, that work can be resumed this week. In three weeks or less time the job should be completed. The plumbing is roughed in, and the installation of furnaces is practically finished."

Yuma

The maximum temperature for the two-week period ending November 28 was 73, the minimum 21, and the greatest daily range 43. The precipitation was .02 inch.

The cold period of November 21-28 followed a general rain and snow-storm in the mountainous sections of northern Arizona and in the Coast range to the west. The thermographic record for the night of November 22-23 showed a below-freezing temperature from 9:00 p.m. to 8:00 a.m. Nearly all citrus plantings in the valley sections of the project were nipped. In some exposed plantings the trees were defoliated. Most of the damage, however, will amount to a loss of some leaves and small branches. The mesa sections of the project, where most of the citrus fruit is grown, escaped cold-weather damage. This low temperature for November is unusual.

With the advent of cooler weather, hay prices have advanced about $2.00 a ton. Most of the project holdings at this time of the year consist of alfalfa straw. This can be bought in the stack for $3.00 to $4.00 a ton.

The first of the winter lettuce crop will be cut within the next ten days. After the trouble with caterpillars, worms, and grasshoppers, this crop has come along nicely. No cold weather damage was reported from these fields.

To date 7,142 bales of cotton have been ginned on the project. Two of the nine gins which operated at the beginning of the 1931 season have closed. The second picking of Pima cotton on the station plots was begun last week. The cotton has opened up nicely since the frost and a final picking can be made on most of the fields. The new ginning equipment has been installed and one bale was turned out last week. Mr. Townsend, who has been here since November 6, has gone to Shafter, Calif., to look into the ginning problems at that station.

Most of the barley, wheat, and new alfalfa plots have been planted. Caterpillars have been doing some damage to these plantings, but the recent cold weather has decreased their numbers.

Mr. J. H. McCormick, of the Division of Irrigation, Bureau of Agricultural Engineering, started his cooperative work on the irrigated rotations during the past week. The plots chosen for this work include five planted to alfalfa, five to cotton, three to barley, and three to grain sorghum. A Sparling water meter has been obtained for the preliminary work in measuring the irrigation water.

Messrs. Edgar Brown, of Washington, and W. L. Goss, of the Field Laboratory at Sacramento, were station visitors during the week of November 15.

E. G. Noble.

W E E K L Y R E P O R T S

Of The Division Of

WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

Vol. XXXIII December 5 and 12, 1931 No. 23

Belle Fourche

Report of Lamb Feeding Test with Alfalfa Screenings

On August 28, 55 grade Hampshire lambs were divided into four lots and fed for 76 days to determine the feed value of alfalfa screenings. Lot 1 was fed barley and alfalfa hay; lot 2, barley 85 per cent, alfalfa screenings 15 per cent, and alfalfa hay; lot 3, barley 70 per cent, alfalfa screenings 30 per cent, and alfalfa hay; lot 4, barley 50 per cent, alfalfa screenings 50 per cent, and alfalfa hay.

The lambs were started on feed at 1/2 pound a day and were on full feed in 50 days, consuming 2-1/3 pounds of grain and 2.1 pounds of alfalfa per day. The average initial weight at the beginning of the test was 73.5 pounds for all the lots. For lot 1 the final weight was 104.7 pounds and the average daily gain .411 pound; lot 2, final weight 102.1, average daily gain .377; lot 3, final weight 100.7, average daily gain .359; and lot 4, final weight 100.7, and average daily gain .356 pound.

The feed requirements for 100 pounds of gain in lot 1 was 397 pounds of barley and 477 pounds of alfalfa hay; in lot 2, 371 pounds of barley, 66 pounds of alfalfa screenings, and 525 pounds of alfalfa hay; in lot 3, 304 pounds of barley, 131 pounds of alfalfa screenings, and 572 pounds of alfalfa hay; in lot 4, 223 pounds of barley, 223 pounds of alfalfa screenings, and 661 pounds of alfalfa hay. As the alfalfa screenings were increased in the ration, the hay requirements per 100 pounds of gain also increased.

The lambs were charged in at 4 cents a pound and were sold on the Sioux City market for $5.50 a hundredweight. The top for the day was $5.80. These lambs were all fat, but were too heavy. The shrinkage between the farm weight and the actual selling weight at Sioux City was 3.7 pounds. The dressing per cent was 48.8.

The prices used in calculating these results were: Barley, $16 per ton; alfalfa screenings, $10 per ton; and alfalfa hay, $10 per ton.

In lot 1 the loss was 5 cents per lamb; in lot 2, 15 cents per lamb; in lot 3, 15 cents per lamb; and in lot 4, 21 cents per lamb.

The indications from this test are that one pound of alfalfa screenings is equal to about 1/2 pound of barley when the alfalfa screenings do not exceed 25 to 30 per cent of the barley ration.

Beyer Aune.

Huntley

The maximum temperature during the week ending November 28 was 35, minimum -5, and precipitation .4 inch. The first snowfall of the season occurred during the week; the precipitation recorded was .4 inch.

Huntley (cont'd)

This snow was general and was reported to be much heavier in the mountain sections of the State.

The weather was favorable for the harvest of sugar beets, which was completed before this storm occurred. More than the usual amount of fall plowing has been done. The last of the sugar beets in the receiving station silos are being moved to the factory.

Conditions have also been favorable for feeding operations. Midseason weights, taken on November 28, of the lambs in the feeding experiment at the station indicate that in some of the lots they have made an average gain of 1/2 pound daily during the first 50 days of the experiment.

The local price of alfalfa hay continues at $8 to $9 a ton. Great Northern beans are quoted at $1.75 a hundredweight. Butterfat is selling at 26 cents and eggs at 35 cents.

Dan Hansen.

Newlands

The average maximum temperature for the three-week period ending December 12 was 37.5, with a maximum of 51 on December 7; the average minimum was 11.7, with a minimum of 1 on November 23 and 24. The mean temperature was 24.6. The average hourly wind movement was 1.62 miles. There was .31 of an inch of precipitation.

The weather during this period has been a little cooler than usual. Heavy snow-storms occurred in the Sierra Nevada Mountains west of the project. The present snowfall has exceeded the total fall of last year and is far above the average of recent years. It is from the snow in these mountains that the water supply of the Newlands project is obtained. The heaviest storms generally occur in January and February. The outlook for an ample supply of irrigation water for next season is much brighter than it has been for some time.

The Thanksgiving turkey pool brought a top price of 32 cents and 29 cents a pound f.o.b. San Francisco. The Christmas pool will probably be sold at 30 cents and 28 cents f.o.b. Fallon. Butterfat is bringing 31 cents a pound. Hay that remains unsold is being held for higher prices than formerly. Some farmers are asking $10 a ton in the stack. Much of the feeder hay has been purchased, which accounts for the higher price demanded for the remaining unsold hay.

The cold weather has been the cause of the usual amount of frozen pipes, etc. at the Field Station. Watering the stock becomes quite a task during such times. It has been necessary to cut down several trees that were in the way of the new land leveling development. The stumps were removed from the soil with heavy charges of dynamite. It is a rather difficult job to keep the tractor working with the ground freezing each night. However, up to this time it has worked daily and will continue to do so as long as possible. It has been necessary to replace all the old lugs on the wheels with new ones. The sandy soil soon wears the lugs to thin razor edges, which results in their complete destruction.

E. W. Knight.

Prosser

The weather has been cold and foggy, and during the first part of the week ending December 5 3.3 inches of snow fell, making a total of 5.3 inches on the ground. The minimum temperature was 15°, the maximum 29.5, and the greatest daily range 12.5.

The Washington State Horticultural Association held its annual meeting in Yakima on December 1, 2, and 3. The meeting was well attended by fruit growers from the irrigated districts of Washington, especially from the Yakima Valley and the Wenatchee district. Representatives were also present from the irrigated districts of Idaho and Oregon. Marketing and production problems were discussed.

The following table gives a summary of the orchard irrigation project conducted at the station the past season. Results previously reported for this project were for one specific tree on each plot, which had six locations sampled before and after each irrigation. The results presented here are averages for the whole plot on which ten locations were sampled before and after irrigation.

Items	Light irrigation		Medium irrigation		Heavy irrigation	
Hours run	9	18	12	24	18	36
Frequency (days).....	15	30	15	30	15	30
Number of irrigations	9	5	9	5	10	5
Average acre-inches for each application....	3.3	6.3	4.1	8.0	6.0	9.6
Net acre-inches for season	30.0	31.69	38.77	41.51	60.20	48.22
Average acre-inches surface run-off.....	.32	.70	.49	.89	.65	2.31
Average acre-inches increase in 6-ft. layer	1.61	4.75	2.75	6.71	3.65	7.26
Average acre-inches decrease in 6-ft. layer	1.45	5.07	3.45	6.37	2.87	6.32
Average acre-inches before irrigation 6-ft. layer	6.91	9.23	11.41	9.98	15.67	11.89
Average acre-inches after irrigation 6-ft. layer	8.52	13.98	14.16	16.69	19.32	19.15

U. S. No. 1 potatoes (sacked) were being sold by the growers for $16 a ton. If low temperatures continue, the price of potatoes is expected to advance. At the present time, baker potatoes are being sold for $19 to $20 a ton. Orders for Christmas apples from the Yakima Valley are not so large as normally. No. 1 alfalfa hay is $8.50 to $10 a ton. Wheat is 65 cents a bushel.

The weather has continued to be cold and foggy during the week ending December 12. With 1.3 inches additional snowfall during the week the total amount on the ground at the present time is 4.5 inches. The maximum temperature was 42°, the minimum 12°, and the greatest daily range 26.5°.

Prosser (cont'd)

A stove has been installed in the laboratory, and the room is being inclosed with plaster board so that the room may be heated more easily.

The potatoes grown at the station have been sorted and the U. S. No. 1 grade sold for $15 a ton without the sacks. The price of potatoes has declined from $16 to $14 a ton during the last few days. Eleven cars of potatoes were shipped from the Yakima Valley to western Washington and six cars to California the past week. Purchases in the valley were few, but the movement from the valley the past week was nearly double that of the previous week and approximately the same as in a corresponding week last year. There was no change in the price of alfalfa hay, which is quoted at $8.50 to $10 a ton. The baling of hay in the valley continued with little interruption the past week, and the movement was greater than the previous week because the Coast stocks were low. Purchases had to be made by jobbers to replenish the supply. Growers have been receiving as high as $65 a ton for onions. The movement of this product has been greater this year than it was at a corresponding time last year.

Carl A. Larson.

San Antonio

Although there was a measurable amount of precipitation on eight different days of the two-week period ending December 5, a total of only .54 inch was recorded.

Plots on which a winter green manure crop is to be grown were disked, harrowed, and seeded, seven plots being planted to winter field peas and one to winter rye. The seed bed was in fair tilth and contained enough moisture to start germination, but the subsoil contained practically no available moisture. Summer and fall-plowed plots remained too rough and dry to work into suitable seed beds for small grains and flax.

The wind suddenly swung into the north about dawn of November 24 and has continued from that general direction practically ever since. Daily maximum temperatures, which had been running in the upper 70's and 80's, have been approximately 20° lower the past two weeks, while the average minimum temperatures have been only about 10° lower than they were during the first part of November. The first frost of this season occurred the night of December 3 with a minimum of 32°. Notwithstanding the week of subnormal temperature at the close of the month, the mean for November was 5.1° above the 24-year average mean.

Summary of Meteorological Data

Week ending	Temperature						Precipitation (in.)	Aspect of the sky (days)		
	Maximum		Minimum		Mean	G. D. R.		Clear	Partly cloudy	Cloudy
	Absolute	Mean	Absolute	Mean						
Nov. 28	82	62.7	45	50.7	56.7	31	.15	0	0	7
Month of Nov.	86	76.7	43	54.0	65.3	37	.88	6	9	15
Dec. 5	72	58.1	32	41.4	49.8	30	.39	1	2	4

Geo. T. Ratliffe.

Scotts Bluff

The average maximum temperature for the week ending December 5 was 39°, with a maximum of 46; the average minimum was 8, with a minimum of 3°. The average hourly wind movement for the period was 5.9 miles. There was no precipitation.

During the week a carload of lambs was received from Denver and will be ready to go on feed as soon as the present test is closed, which will be December 9. These lambs are of good quality and averaged 65 pounds each at Denver.

The corn plots in field K have been husked and the following yields were obtained:

Rotation	Pounds per plot	Bushels per acre
2	250	14.3
26	420	24.0
16	340	19.4
32	440	25.1
62	860	49.1

Bids for the Christmas sale of turkeys were received by the Poultry Marketing Association on Friday. The turkeys were sold to the Jerpe Commission Company of Omaha for the following prices: No. 1 toms and hens, 25 cents; mediums, 21½ cents; old toms, 20 cents; No. 2, 17 cents. More will probably be sold at this time than in November. A few are holding for February sale again, as those who sold in February last year got a better price than at the holiday season, even with the additional expense for feed.

The station sold seven cull cows, six old sows, and five shoats at the public sale this week, and good prices were received.

A few lambs are still coming in to feeders. A few cars of lambs that went into feed lots early have been marketed at a loss, for they were purchased at a little higher price than they brought when finished. It is believed that about as many lambs will be on feed in the Nebraska district as there were last year. At the livestock sale on Saturday seven or eight cars of feeder cattle were bought by local feeders.

The average maximum temperature for the week ending December 12 was 39°, with a maximum of 46; the average minimum was 12, with a minimum of 6. The average wind movement was 4.4 miles an hour. There has been a little snow, but not enough to determine the precipitation.

Eleven cars of turkeys were sold by the Poultry Marketing Association for the Christmas trade.

Feeder lambs continue to come into the valley. According to the Bureau of Markets at Denver, there are as many lambs in the Scottsbluff area on December 1 as there were last year on January 1. There may be 10 per cent more than last year. The price of both fat lambs and feeders is still declining. The top price at Omaha at the end of the week was $5 and the feeder market at Denver from $4 down. One lot of Southern lambs came into the valley at $2, with freight paid to the Missouri River.

The experimental lambs were shipped at the end of the week. The gains made were very satisfactory and were some higher than the corresponding lot last year.

Scotts Bluff (cont'd)

The Superintendent spent most of the week on the organized agriculture tour. He attended meetings at Chappell, Kimball, Scottsbluff, and Alliance. Attendance was very good at all of the meetings.

The prices of grains are holding the gains recently made. Butterfat has declined to 24 cents; hogs are now below $4; heavy well-finished steers remain steady at $12, but all other grades are showing declines.

James A. Holden.

Yuma

The maximum temperature for the week ending December 5 was 69, minimum 28, and greatest daily range 40. There was no precipitation. For the past two weeks the maximum temperatures have been below 70°. The minimum readings have been around 34. A cold northwest wind has been blowing practically every day.

A light cutting of hay is being harvested on most of the alfalfa fields on the project. This growth was nipped by the hard frost two weeks ago. The annual practice of renovating and reseeding alfalfa fields is now taking place.

Cotton is coming in to the gins very slowly. Picking costs remain at 50 cents per hundredweight, but pickers are becoming scarce. Up to this time only 8,000 bales have been ginned. On a slightly larger acreage last year 22,000 bales had been ginned before December 1.

Early lettuce is now being harvested and is bringing good prices. Damage caused by cold weather in other lettuce-growing districts has greatly helped the local market. The Imperial Valley is also shipping lettuce.

Citrus fruits on the project are being sold for the most part on the receipt of shipping orders. Coast prices are somewhat lower than last year. The recent cold weather has damaged some of the valley fruit on this project and also in the Imperial Valley. This damaged fruit is being rushed to the market before it begins to show any deterioration.

Station work during the week has included the picking of cotton, cutting cotton stalks, seeding barley and alfalfa, examining cotton plots for nematode infestation, burning borders and ditch banks, pruning date palms, repairing domestic water and sewer lines, general irrigating and cultivating.

E. G. Noble.

W E E K L Y R E P O R T S

Of The Division Of

WESTERN IRRIGATION AGRICULTURE

(Not for publication without the prior consent of this division)

Vol. XXXIII December 19 and 26, 1931 No. 24

Huntley

The maximum temperature during the two-week period ending December 19 was 56 and the minimum -11. The precipitation was .35 inch, occurring in the form of snow, and was the heaviest snowfall so far this season. This storm was general over the State and was reported to be much heavier in the mountain sections where there is already as much snow as fell during the entire preceding winter.

The loading of beets was completed at local receiving stations, and the supply at the sugar factory is sufficient to keep it in operation until some time after January 1. The average yield of beets was slightly less than 12 tons per acre, and the average sugar content was over 17 per cent.

The price of Great Northern beans has declined to $1.10 per hundredweight and a large amount of the season's crop is unsold. Butterfat is selling at 24 cents a pound and eggs at 35 cents a dozen. Alfalfa hay is selling at $8.00 a ton on farms.

Arrangements are being made to hold a lamb feeders' day at the station on January 8, when 12 lots of lambs will have completed a 90-day feeding period and the results of the tests will be made available. The heaviest lambs in each lot will be marketed at that time and the remainder held on feed for another 20 days.

Dan Hansen.

Prosser

During the first part of the week ending December 19 the temperature hovered around the zero mark, the lowest being -1°. The latter part of the week the temperature rose to 48° and thawing was quite general, accompanied by rain. There are 67 inches of snow in Snoqualmie Pass in the Cascade Mountains. The reservoir reports show that more than 115,000 acre-feet of water is held, which is considerably less than last year at this time; but the amount of snow in the mountains is very much greater this year.

The price of butterfat has decreased from 30 to 26 cents a pound. The price of other farm produce has not changed. Last week was exceptionally dull in the Yakima apple market, as the local markets have already been supplied for the holiday trade and the export market was inactive.

Report for week ending December 26

Produce forwardings from the Yakima Valley filled 44,397 cars, with a total value of $27,510,805 for the year 1931, according to the Valley Traffic and Credit Association. More than $17,000,000 of this amount was derived from fresh fruits, melons, vegetables, preserved

Prosser (cont'd)

fruits and vegetables, and by-products. There was a noticeable increase in fruit by-products this year compared to 1930, but because of lower prices their value did not exceed the 1930 values. The onion crop is bringing into the valley $419,000 this year as against $93,000 in 1930. The tonnage for meat and meat products was the same as last year, but the value was $300,000 less. Grain and grain products were valued at almost a million dollars. The number of carloads and the value of hay, straw, and hay products were as follows:

Carloads		Value
5,540	Hay - 3,740 cars shipped @ $9.00 per ton	$437,580
	1,800 cars stored valued @ $9.00 a ton..	210,600
	1,500 tons fed in transit	13,500
915	Straw @ $6.50 per ton	77,317
250	Alfalfa meal, 5,000 tons @$16.50	82,500
325	Hay, straw, and alfalfa meal shipped by trucks	33,800
7,030	Total value of hay, straw, and hay products ...	$855,297

The total value of livestock products was $1,343,050 and dairy products $1,367,700. Poultry and eggs were valued at $689,825.

The price of butterfat is now 23 cents a pound. Potato prices are now quoted at $14 and $15 a ton.

The snow has practically all disappeared from the valley except a few scattered areas on north slopes. The rainfall for the week was .97 inch. The maximum temperature was 50.5°, the minimum 25, and the greatest daily range 22.5°. In Snoqualmie Pass of the Cascade Mountains the snow is 66 inches deep.

Carl A. Larson.

Scotts Bluff

The average maximum temperature for the week ending December 19 was 43°, with a maximum of 55; the average minimum was 13, with a minimum of 6 below zero. The average wind movement was 4.4 miles an hour. No precipitation was recorded.

The lambs for the regular winter feeding tests were weighed and put into the feed lots during the week. They averaged 58½ pounds. The lambs sold on Tuesday's market last week (from the station) brought the top price of $5.25, but since that date the market broke and the latter part of the week the price for fat lambs dropped below $5.00.

According to unofficial reports, there is more than the normal amount of snow at this time of the year in the North Platte watershed. It is said that there has been more snow in the Wyoming portion of the area than in the North Park country of Colorado.

The sugar campaign has closed for the season of 1931. The maximum yield on 10 or more acres was 23.6 tons per acre on a 20-acre field; the maximum sugar content was 19.1 per cent. The sugar content of the crop increased steadily during the entire month of October and well into November. The majority of the ten growers whose beets had the highest sugar content, varying from 18.4 to 19.1 per cent, delayed their deliveries in order to benefit from the rapid accumulation of sugar that took place. The maximum sugar per acre for the ten highest yields varied from 3.45 tons to 3.82 tons.

Scotts Bluff (cont'd)

The sugar content of the beets from the station was 17.5 per cent. The average yield for the Nebraska district has not yet been determined, but it will be less than 14 tons. It is believed that the Nebraska district had the highest yield in the Great Western territory.

The average maximum temperature for the week ending December 26 was 50°, with a maximum of 56; the average minimum was 23, with a minimum of 16. There was no precipitation. The wind movement averaged 5.6 miles per hour.

The weather during the past week has been unusually mild. Practically all of the snow has gone and the ground is thawing in many places. There has been very little moisture so far, but the winter wheat sections of the valley have reported no damage as yet. There was some rather severe weather during the latter part of November and the first half of December, but the grain has not been injured so far.

The North Platte Valley Lamb Feeders' Association held its annual meeting this week, and the old officers were reelected. The meeting was well attended from all sections of the valley and many new members were added. A sum of money was appropriated to be used in a campaign advertising meat products.

The price of butterfat is down to 22 cents. In normal times it is higher in December than in January, so there is little hope of its advancing much above present prices. Eggs are also lower, being worth now only 28 cents.

The in-movement of feeder lambs is about over. The movement of hogs and cattle through the local sale yards is still strong. Most of the hog sales are to shippers on the west coast. The local price is from 50 to 60 cents below Omaha prices.

Final figures on the sugar beet crop in the valley show an average yield of 14.25 tons per acre as compared with 14.59 tons last year. The following table gives data on the sugar beets grown in Fields K and E.

Scotts Bluff (cont'd)

Yield and Sugar Content of Beets from Rotations and Manured Plots on the Scotts Bluff Field Station in 1931

Rotation No.	Yield of beets per acre, tons	Sugar	
		Per cent	Tons per acre
Field K:			
2	4.48	18.0	0.81
18	7.10	17.8	1.26
20	7.20	18.4	1.33
21	14.77	17.0	2.51
22	4.97	17.0	.84
23	17.51	16.6	2.91
30	5.48	17.5	.96
31	16.10	16.6	2.67
32	6.83	17.8	1.22
40	15.79	17.0	2.69
42	15.06	17.2	2.58
45-1st year	16.99	17.4	2.96
45-2d "	14.12	17.7	2.50
60	14.00	16.4	2.30
61	17.88	15.8	2.83
62	11.87	16.9	2.01
64	15.76	16.2	2.55
71-1st year	14.36	16.2	2.33
71-2d "	13.67	15.7	2.15
Average Field K	12.31	17.0	2.09
Field E:			
I- 7	12.11	17.9	2.17
8	10.75	18.9	2.06
9	10.01	19.0	1.90
10	10.77	19.2	2.07
11	10.46	18.8	1.97
II- 7	11.25	18.6	2.09
8	13.09	17.2	2.25
9	12.85	16.8	2.17
10	13.80	17.0	2.35
11	16.47	15.2	2.50
33	14.50	18.5	2.68
41	13.80	18.6	2.57
46-following oats	8.74	18.2	1.59
46 " potatoes	6.64	17.8	1.18
49	11.46	17.0	1.95
Average Field E	11.78	17.9	2.10

Note: The figures on purity were not considered accurate and have been omitted from the table.

Scotts Bluff (cont'd)

Report on Results of Lamb-Feeding Tests, 1929-1931

Data gathered during the past two years from lamb-feeding tests at the Scotts Bluff Field Station, under the supervision of James A. Holden, should be of interest to the lamb feeders of the sugar beet growing section.

These experiments were planned to gather information on: (1) The most economic mixture of corn and dry pulp to feed; (2) a comparison of the value of corn and barley when fed with dry pulp; (3) the advisability of feeding cottonseed cake in a grain mixture with alfalfa hay and beet tops; (4) the feeding quality of peewee lambs as compared with normal lambs; and (5) the most profitable amount of cottonseed cake to feed with a full ration of dry pulp. When on full feed the lambs were fed the grain or grain mixture at the rate of 1.28 pounds daily per lamb and as much alfalfa hay as they would clean up.

The lambs in lot 1 were fed a full ration of corn; those in lot 2, a mixture of half corn and half dry pulp; those in lot 3, a mixture of five parts corn and eleven parts dry pulp; and those in lot 4, a mixture of one part corn and seven parts dry pulp. Barley and dry pulp in equal parts were fed in lots 5 and 9 in comparison with corn and dry pulp in lots 2 and 7. Lots 7 and 9 also received beet tops. The lambs in lot 6 were fed a mixture of equal parts of corn and dry pulp, alfalfa hay, and beet tops; and those in lot 7 were fed the same ration with the addition of a fourth pound of cottonseed cake per lamb per day.

The lambs used in lot 8 were peewees. It required 37 of these small lambs to weigh the same as the 25 normal lambs in each of the other lots. The 37 small lambs in lot 8 were fed the same amount and kind of feed as was fed to the 25 normal lambs in lot 7. The lambs in lots 10, 11, 12, and 13 were fed cottonseed cake at the rate of .40, .32, .16, and .08 pound, respectively, per lamb daily with full rations of dry pulp.

The lambs were on feed 126 days. The amount of gains made, the feed per 100 pounds gain, and the cost of feed, based on present local prices, per 100 pounds gain are given in the following table. These data are based on feed-lot gains. If figured on the basis of feed-lot-to-market gains, the gains per lamb would be reduced about 6 pounds and the amount and cost of feed per 100 pounds gain would be increased about 20 per cent. On the basis of range to market gains, this difference would be still greater.

Scotts Bluff (cont'd)

Table showing gains made per lamb, pounds feed per 100 pounds gain, and cost of feed per 100 pounds gain from two years' lamb-feeding tests

Lot No.	Feed-lot gains per lamb	Pounds feed per 100 pounds feed-lot gains						Cost of feed-lot gains
		Cake	Corn	Pulp	Barley	Alfalfa	Tops	
	Pounds							
1	32.2	--	402	--	---	590	---	$5.39
2	32.9	--	214	213	---	534	---	4.81
3	28.4	--	147	352	---	615	---	5.28
4	25.4	--	62	457	---	712	---	5.44
5	32.0	--	---	220	219	558	---	4.53
6	37.9	--	186	185	---	376	2.19	4.57
7	44.5	58	159	159	---	305	1.81	4.54
8	37.9	51	141	139	---	286	1.67	4.07
9	42.0	61	---	169	169	303	1.90	4.41
10	39.9	102	---	348	---	374	----	4.43
11	39.1	86	---	357	---	444	----	4.51
12	33.0	51	---	424		518	----	4.71
13	28.4	34	---	494	---	578	----	5.11

As shown in the table, the gains per lamb varied from 25.4 pounds in lot 4 to 44.5 pounds in lot 7, and the feed cost per 100 pounds gain varied from $4.07 to $5.44. It appears from these two years' tests that a 50-50 mixture of corn and dry pulp will produce as good gains as all corn and at a lower cost, but to use more than half dry pulp in the mixture decreases the gains and increases the cost.

In the comparison of corn and barley when each was fed in a 50-50 mixture with dry pulp, the lambs fed corn and dry pulp made more gain and required less feed per pound gain, but the gain was more costly than where barley and dry pulp were fed. Beet tops and cottonseed cake added to corn and dry pulp materially increased the gains and lowered the costs. Cottonseed cake added to a corn-pulp ration with beet tops increased the total gain per lamb 6.6 pounds and also lowered the cost of gain.

Peewee lambs made more gains per initial weight and at a lower cost than did normal weight lambs.

A heavy feed of cottonseed cake showed a decided advantage when fed in a full ration of dry pulp. Where .4 pound of cottonseed cake was fed per lamb daily the gains were 39.9 pounds per lamb, with a feed cost of $4.43 per 100 pounds gain; and where only .08 pound of cake was fed daily the gains were 28.4 pounds and the cost was $5.11. The gains made per lamb decreased and the cost of feed per 100 pounds gain increased as the cottonseed cake in the ration decreased. There was no digestive trouble in the lot where .4 pound of cottonseed cake was fed daily.

Three factors influence the value of a ration—amount of gains, quality of gains, and cost of gains. The most economic combination of these three factors makes the best ration. The most valuable one is the cost-of-gain factor. The best ration a year ago may not be the best ration now because of a change in prices. The prices of dry pulp and cottonseed cake were too high last winter in comparison with the prices of other feeds, but now they are both cheap. Corn is only slightly lower than it was last winter and barley is the same price, but the price of dry pulp and cottonseed cake are both 40 per cent less.

James A. Holden.

M I S C E L L A N E O U S

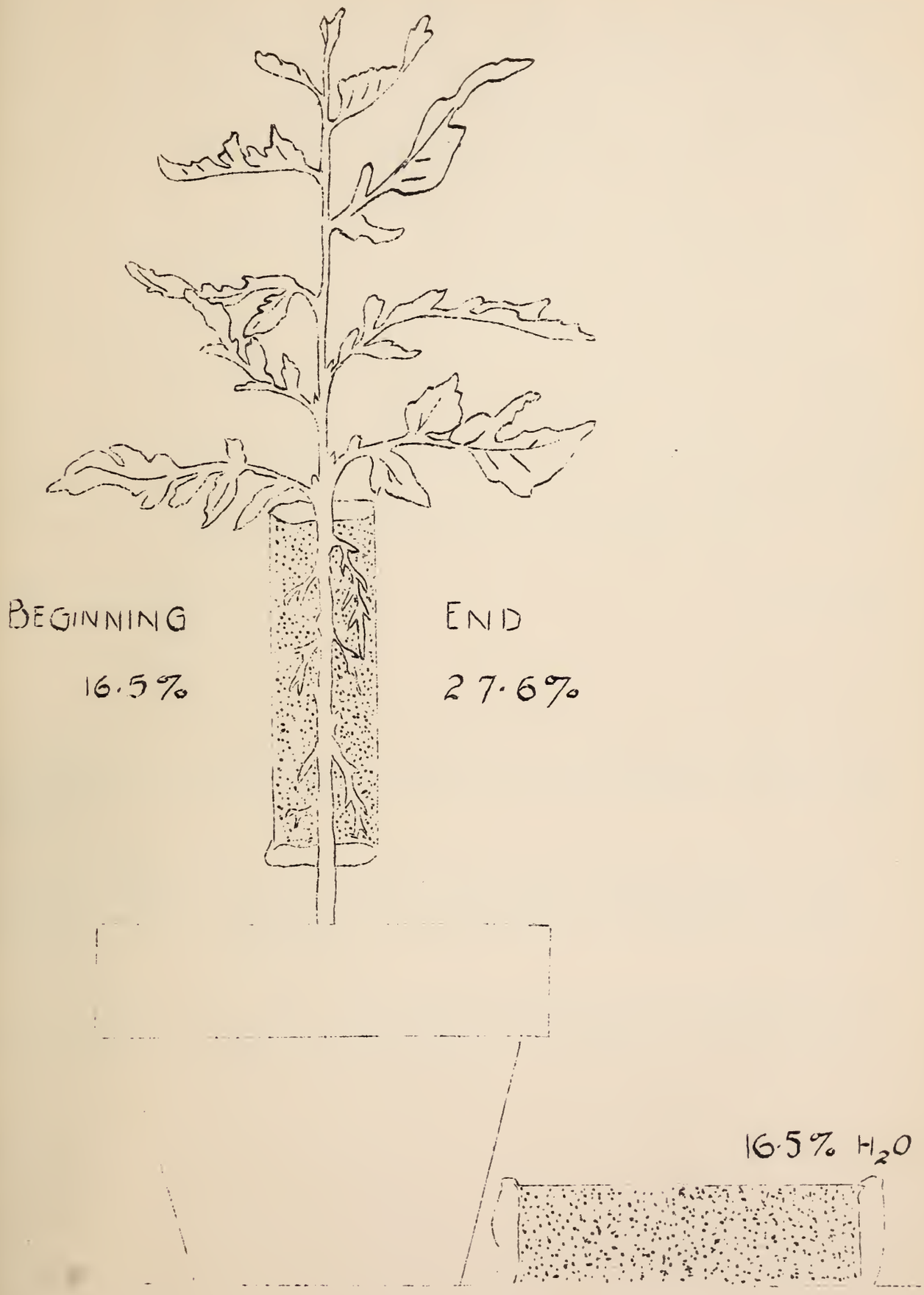
THE TRANSLOCATION OF SOIL MOISTURE BY THE ROOTS OF PLANTS

In Technical Bulletin 29 of the Arizona Experiment Station, published in 1930, the writer attempted to present the plant as a great equalizer of forces. A plant is in equilibrium, or in a condition approaching equilibrium, with all natural forces, and its tendency at all times is to maintain this equilibrium. In this respect the phenomenon of water absorption by roots is especially interesting.

The pull of the plant for water amounts to about 7 or 8 atmospheres, that is, from about 105 to 120 pounds per square inch, while the pull of the soil for water varies from zero in a saturated soil up to probably 25,000 or more atmospheres in a perfectly dry soil. In an ordinary air-dry soil the pull is approximately 1,000 atmospheres. No plant can stand such a pull as this. Therefore, when a plant is placed in a saturated soil the balance of power is in favor of the plant, so the water will move freely from the soil to the plant. As the percentage of water in the soil is reduced, the thickness of the moisture film is decreased and the pull of the soil for water increases. The pull of the plant for water remains fairly constant, so at the wilting percentage the pull of the plant and the pull of the soil are balanced exactly; that is, each pulls about 8 atmospheres, and no water can be taken from the soil. If further loss of water from the soil takes place by direct evaporation from its surface, its pull will be increased rapidly. Under such conditions the water will move from the plant to the soil. The plant must now either supply this water from that stored up in its tissues, as in the case of cactus, or it must absorb water from some other part of the soil which is above the wilting point, transport this water, and exude it into the dry portions, or the plant must wilt and die.

The writer has shown that a plant which has a tap root growing down into a moist subsoil, with its feeder roots in a surface soil which has been reduced to the wilting point, is able to draw a certain amount of water from the subsoil and to exude this water into the surface soil, and keep the soil which is in direct contact with the feeding root at the wilting percentage. This phenomenon may enable the plant to tide over long periods of water stress.

The writer has conducted many experiments recently which prove this point. One of these is illustrated in the accompanying cut. A heavy alluvial soil was used known as the Mission soil, because it was collected near the Mission of San Xavier. This soil had a wilting percentage of about 20.5, determined by both the centrifugal machine and by plant tests. A tomato plant was grown in a pot of this good soil until it was about 12 inches high. The leaves were removed from the lower part of the vine and the wounds allowed to heal. A glass tube, about one inch in diameter, was then placed over a section of the stem, sealed at the bottom with a cork, paraffined, and filled with soil which was made up to 4 per cent below the wilting point. The tube was then sealed around the plant at the top with paraffine and beeswax. At the same time another tube was filled with the same soil, sealed, and placed beside the culture pot (see illustration). The pot of soil was kept moist and the plant allowed to grow for about two weeks, when


BEGINNING
16.5%
END
27.6%
16.5% H_2O

The Translocation of Soil Moisture by the Roots of Plants (cont'd)

roots began to develop in the tube, and the soil indicated by its color, when compared with the control tube, that it was accumulating moisture. After about three weeks the tube around the plant was taken off and the moisture in both tubes determined. It was found that the check tube still contained 16.5 per cent of moisture, while the tube which was around the plant had built up to 27.6 per cent. Evidently the tomato plant had pumped water from the moist soil in the pot and had distributed this water to the dry soil. It was noticed that the soil in close contact with the roots was wetter than that some distance away. This experiment showed also that roots will develop in a soil at, at least, 4 per cent below the wilting point. These roots were covered with root hairs and were evidently absorbing the plant food with which they came in contact. The phenomenon of plant food absorption will be discussed later.

This experiment illustrates how it is possible for a desert plant, a mesquite tree, for example, to send down its roots through 20 or more feet of dry soil into a water-bearing stratum. Occasionally, rains wet the surface soil; this water is absorbed by the plant, transported to the growing tip of the tap root, and exuded into the soil. The root can then elongate into a moist soil and never come in contact with any soil which is below the wilting point.

Tucson, Arizona
Dec. 15, 1931

J. F. Breazeale.

Mr. C. S. Scofield left Washington on January 8, 1932, for Riverside, California, where he will be located during the next few months.

A manuscript entitled "Agricultural Investigations at the Huntley, Montana, Field Station, 1927-1930," by Dan Hansen, A. E. Seamens, and D. V. Kopland, has been submitted for publication as a Circular of the Department.

Circular No. 193, "Crop Rotation and Tillage Experiments at the San Antonio (Texas) Field Station," by George T. Ratliffe and I. M. Atkins, has just been published.

I N D E X

Vol. XXXIII

Miscellaneous